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# ENVIRONMENTAL NOISE MEASUREMENTS ON INTERSTATE 57 DURING AND AFTER TRUCK STRIKE

CONSTRUCTION ENGINEERING RESEARCH LABORATORY
(ARMY)

PREPARED FOR
ENVIRONMENTAL PROTECTION AGENCY

JUNE 1974

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# ENVIRONMENTAL NOISE MEASUREMENTS ON INTERSTATE 57 DURING AND AFTER TRUCK STRIKE

**JUNE 1974**

OFFICE OF NOISE ABATEMENT AND CONTROL

Washington, D.C. 20460

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In response to the impending strike, EPA's Office of Noise Abatement and Control sought the collection of data during and after the strike in order to quantify the impact of truck traffic to overall highway noise. EPA assigned the task to the Construction Engineering Research Laboratory (CERL) of the U.S. Army Corps of Engineers. Acting under interagency agreement with EPA, CERL measured highway noise along Interstate 57 between Champaign and Rantoul, Illinois. Data collection, which began February 1, lasted two weeks thus including approximately (see attached)

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Item 16 continued:

equal periods of strike and poststrike (i.e., normal) conditions.

To permit the calculation of day, night and day-night equivalent energy sound levels, noise data, classified according to level, were collected daily at 7 am and 10 pm. With the assistance of the State of Illinois Highway Office, traffic count data were simultaneously collected.

Although data were limited, a very definite increase in equivalent sound level and traffic flow were observed for the period of February 9 to 11 (the post-strike period). The increase, which was 4dB for the day-night level, is believed to be caused by the truck contribution to the noise environment.

5 50/9-74-010

# ENVIRONMENTAL NOISE MEASUREMENTS ON INTERSTATE 57 DURING AND AFTER TRUCK STRIKE

by

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B. L. Homans

**JUNE 1974**

OFFICE OF NOISE ABATEMENT AND CONTROL

Washington, D.C. 20460

Report Prepared under Agreement between Environmental Protection Agency, Office of Noise Abatement and Control and Construction Engineering Research Laboratory of the U.S. Department of the Army

## FOREWORD

The nationwide independent truck drivers' strike of February 1974, afforded a unique opportunity to ascertain the noise impact of trucks on highway noise. For an approximate one-week period beginning February 1, truck traffic—a major contributant to highway noise—was curtailed as between 100,000 and 200,000 independent truckers went on strike.

In response to the impending strike, EPA's Office of Noise Abatement and Control sought the collection of data during and after the strike in order to quantify the impact of truck traffic to overall highway noise. EPA assigned the task to the Construction Engineering Research Laboratory (CERL) of the U. S. Army Corps of Engineers. Acting under interagency agreement with EPA, CERL measured highway noise along Interstate 57 between Champaign and Rantoul, Illinois. Data collection, which began February 1, lasted two weeks thus including approximately equal periods of strike and poststrike (i.e. normal) conditions.

To permit the calculation of day, night, and day-night equivalent energy sound levels, noise data, classified according to level, were collected daily at 7 am and 10 pm. With the assistance of the State of Illinois Highway Office, traffic count data were simultaneously collected.

## FINDINGS

Although data were limited, a very definite increase in equivalent sound level and traffic flow were observed for the period of February 9 to 11 (the post-strike period). The increase, which was 4dB for the day-night level, is

believed to be caused by the truck contribution to the noise environmental for the following reasons:

1. The increase in night level was greater than that for daytime level. Trucks constitute a higher percentage of nightime traffic than daytime traffic.
2. The statistical distributions show a larger increase for higher energy levels after strike settlement than do the middle or lower levels. This contribution would come primarily from trucks.

While it is realized that more quantitative results would have required a well planned comprehensive monitoring program, this rather small program has illustrated that trucks significantly impact on highway noise. Because of its importance, EPA is pleased to make the following CERL report available to the public.

Alvin F. Meyer, Jr.
Deputy Assistant Administrator
for Noise Control Programs

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# ENVIRONMENTAL NOISE MEASUREMENTS ON INTERSTATE 57 DURING AND AFTER TRUCK STRIKE

## BACKGROUND

Environmental noise has been shown to be an adverse factor in the health and welfare of our society. Vehicle noise, and notably truck noise, is considered a major source of environmental noise. The recent truck strike of February 1974 with its corresponding decrease in truck traffic on interstate highways offered a unique opportunity for correlating truck traffic with environmental noise.

## PURPOSE

The purpose of these measurements was to measure the "environment noise" near Interstate 57 in Illinois both during and after the truck strike in order to, if possible, correlate the decreased truck traffic with the decreased level of environmental noise.

## SCOPE

Measurements were made of the acoustical distribution of the A-weighted noise level at a rural location along Interstate 57 between Champaign and Rantoul, Illinois, for a continuous period of 14 days. Simultaneous measurements were made of the traffic flow on the two sides of the freeway.

## PROCEDURE

Two B&K Model 166 Environmental Noise Classifiers were used. One was set for the range 45 to 75 dBA, and the other was set for the range 70 to 100 dBA. A single microphone with wind screen on a tripod at an elevation of 1.2 meters above the ground surface (B&K Model 4117) simultaneously fed the

two classifiers. Electric power was brought to the classifiers over a 230-meter extension cord which was run from the nearest structure. The traffic measurement units were the standard unit used by the State of Illinois, Department of Transportation. Both the traffic counters and the classifiers were checked and read at 7:00 a.m. and 10:00 p.m. of each day, including weekends. Calibration was performed on the classifiers during each checking period, using a suitable single frequency calibrator.

## SITE

The general location of the site is shown in Figure 1. It is approximately midway between Champaign and Rantoul, Illinois on the east side of Interstate 57. The northernmost corner of the State of Illinois truck and snow plow compound was used to house the equipment in a secure area. Figure 2 is a more detailed rendering of the actual site. It should be noted that the area in which the equipment and microphone was placed was a park-like setting and that the closest highway equipment was more than 110 meters from the measurement microphone. The microphone itself was located 20 meters from the center of the nearest line of traffic. Figure 2 also shows the general distances for the interstate highway.

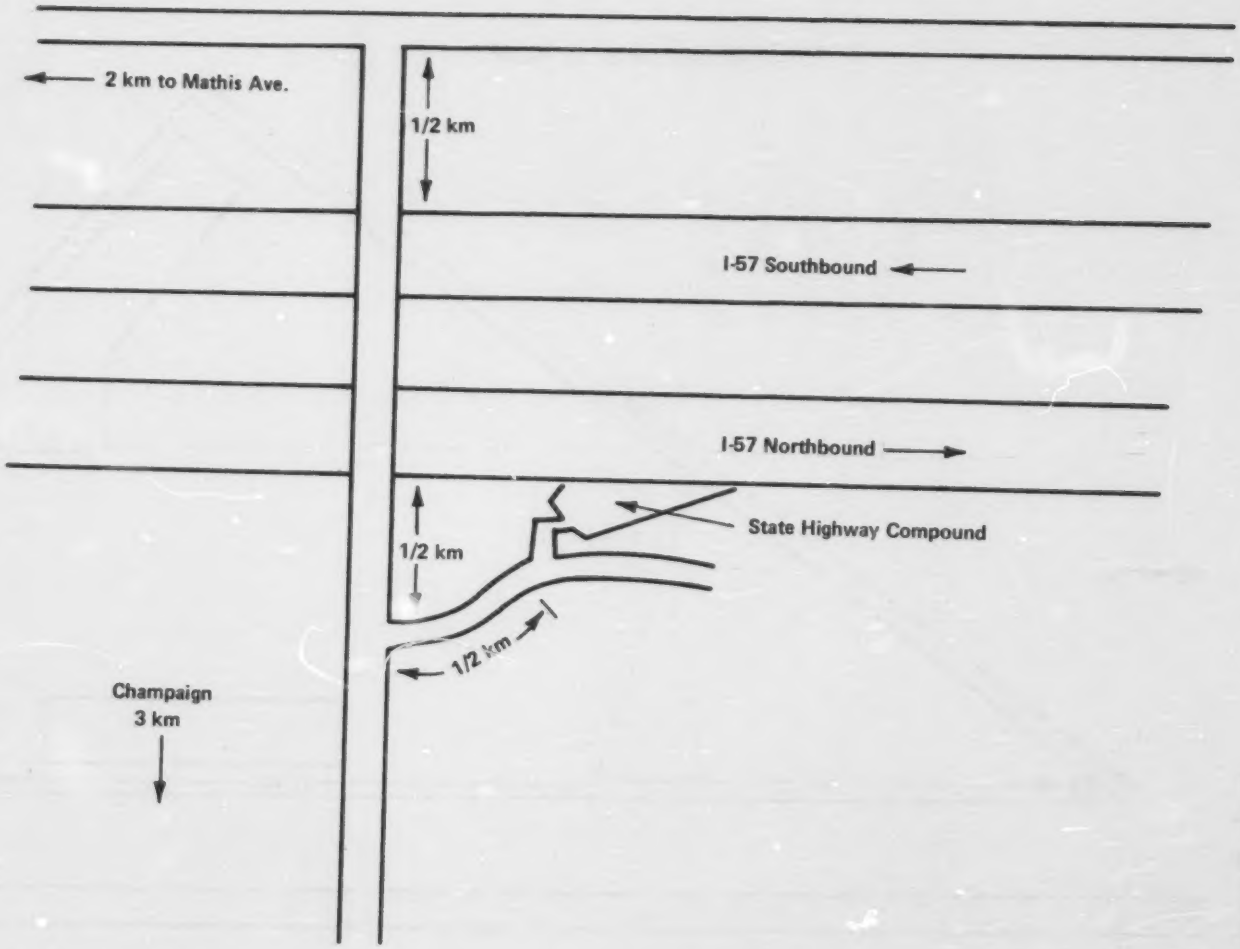



Figure 1. General Site Plan

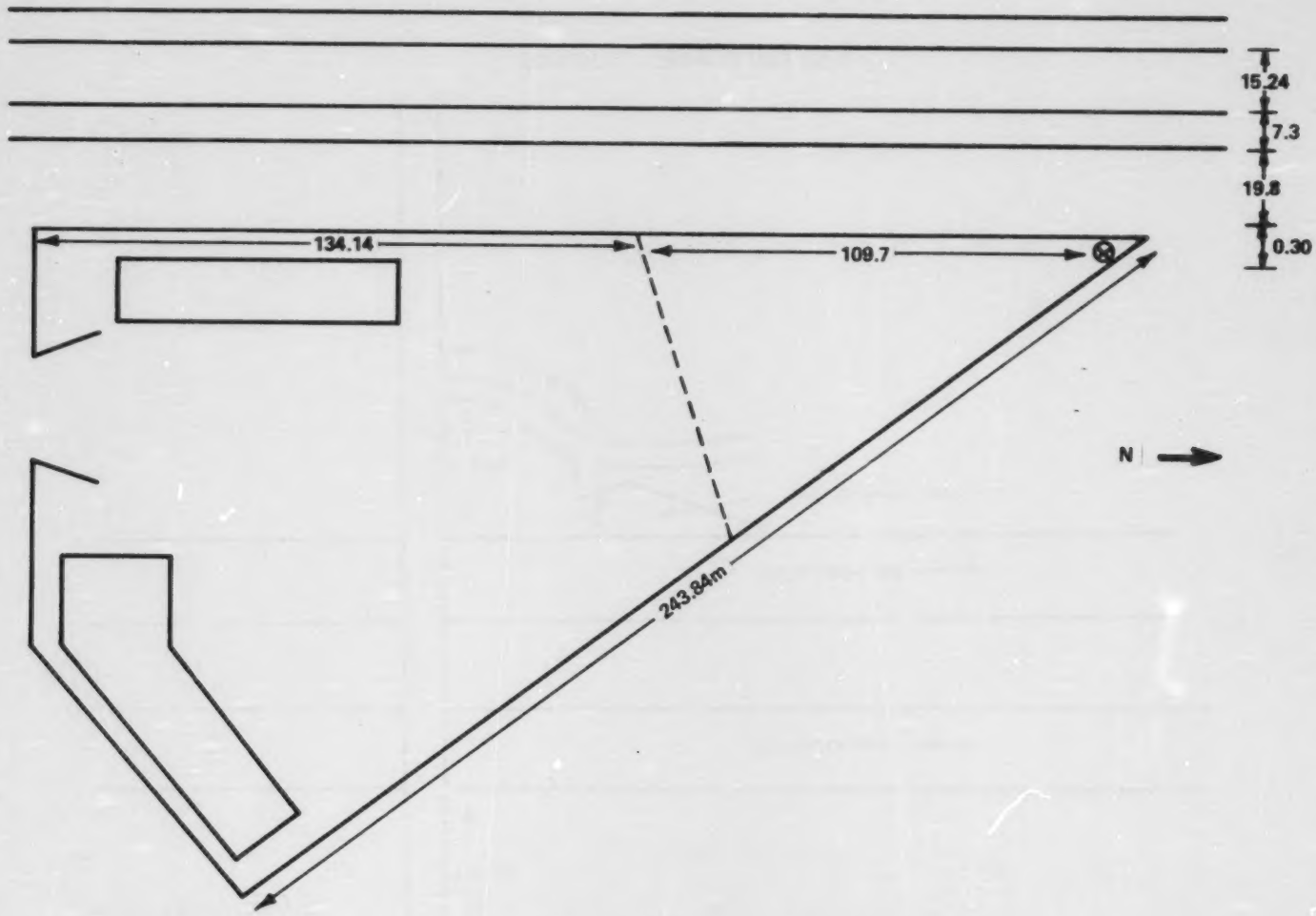



Figure 2. Detailed Site Plan

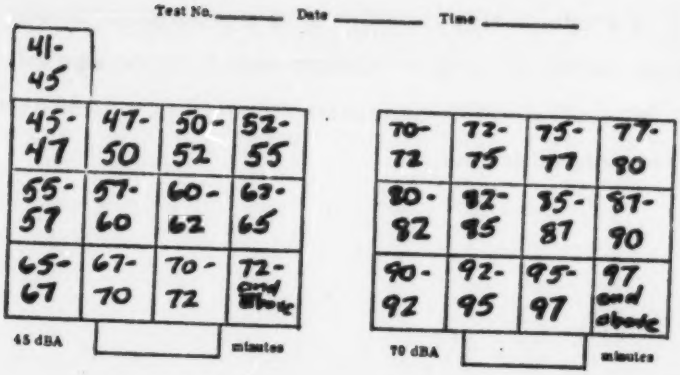
## DATA

The following is a compilation by days of the raw and reduced date. For each day, the raw data during the daytime period (7 a.m. to 10 p.m.) and the raw data during the nightime period (10 p.m. to 7 a.m.) is given. The traffic count during the day and night and the calculated $L_{eq}$ during the day and night are shown along with $L_{dn}$ for that day. Following this information for each day and night is a graph of the levels recorded on the statistical distribution analyzers. Due to the weather, traffic counts could not be made during the entire period. Light snow and its associated snow plowing precluded the use of rubber tube sensors across the highway surface during plowing. Thus, traffic count data is available only for a few days shortly after the beginning of the measurement period (as soon as we were able to obtain equipment from the state) and during the end of the measurement period (it snowed during the middle of the measurement period).

# Data Window Legend

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. _____ Date _____ Time _____




Wind Direction _____

Wind Speed _____

Temperature _____

Weather Conditions _____

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ _____

$L_{dn}$ _____

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 1 Date 1Feb74 Time 2205

| | | | |
|---|---|---|---|
| 0.0 | | | |
| 00 | 1.8 | 8.4 | 36.0 |
| 24.1 | 42.9 | 22.2 | 36.3 |
| 17.2 | 21.5 | 8.7 | 15.3 |

45 dBA 232.8 minutes

| | | | |
|---|---|---|---|
| 10.2 | 8.6 | 2.0 | 4.1 |
| 1.4 | 1.2 | 0.3 | 0.1 |
| 0.0 | 0.0 | 0.0 | 0.0 |

70 dBA 232.8 minutes

Wind Direction NE

Wind Speed 10-14

Temperature 32

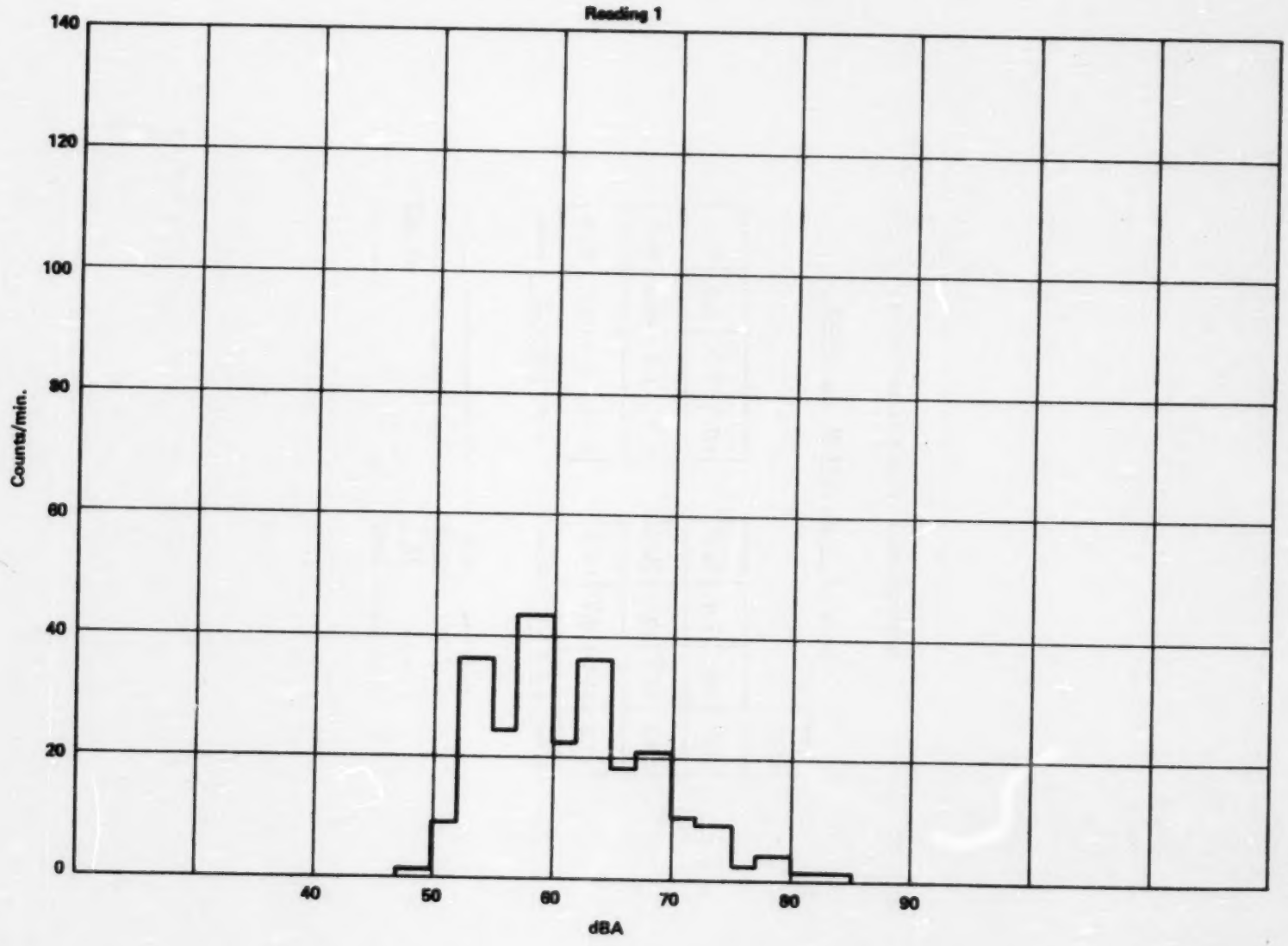
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 68.60

$L_{dn}$ _____


Reading 1
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 2 Date 2 Feb 74 Time 0656

| | | | |
|---|---|---|---|
| 97.6 | | | |
| 2.3 | 69.3 | 50.0 | 80.0 |
| 52.0 | 60.8 | 23.4 | 31.6 |
| 14.2 | 16.9 | 7.3 | 19.2 |

45 dBA 526.3 minutes

| | | | |
|---|---|---|---|
| 8.4 | 9.8 | 2.3 | 5.6 |
| 2.1 | 1.7 | 0.2 | 0.1 |
| 0.0 | 0.1 | 0.0 | 0.1 |

70 dBA 526.3 minutes

Wind Direction _____

Wind Speed _____

Temperature _____

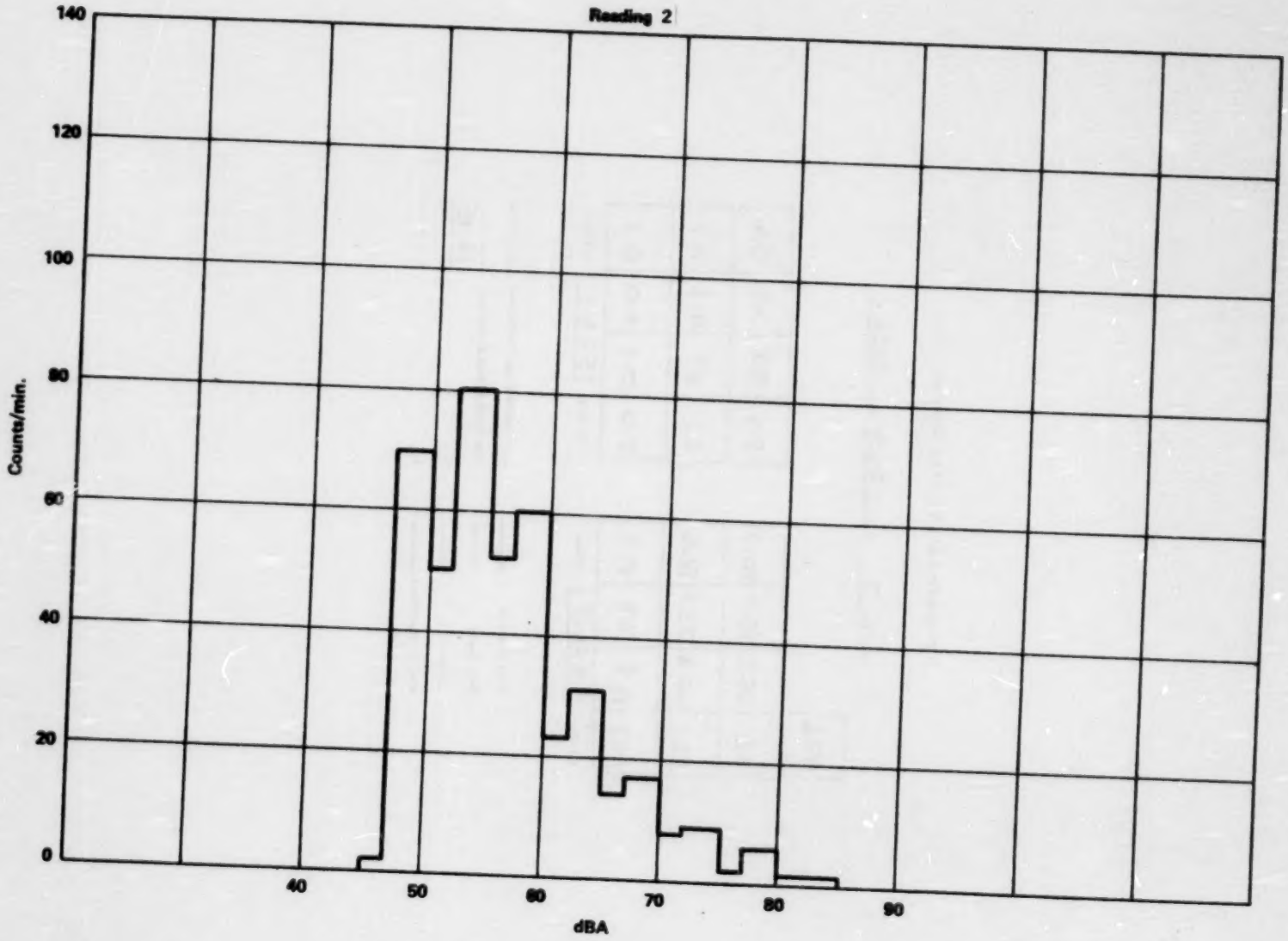
Weather Conditions _____

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 66.15

$L_{dn}$ _____


Reading 2
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 3 Date 2 Feb 74 Time 2157

| | | | |
|---|---|---|---|
| 12.9 | | | |
| 18.8 | 77.2 | 76.0 | 126.9 |
| 81.3 | 139.5 | 66.2 | 111.7 |
| 57.7 | 66.9 | 23.9 | 37.6 |

45 dBA | 901.4 | minutes

| | | | |
|---|---|---|---|
| 29.2 | 21.2 | 4.2 | 9.0 |
| 3.2 | 3.6 | 0.7 | 0.3 |
| 0.1 | 0.1 | 0.0 | 0.0 |

70 dBA | 901.4 | minutes

Wind Direction NE

Wind Speed 3-5

Temperature 31

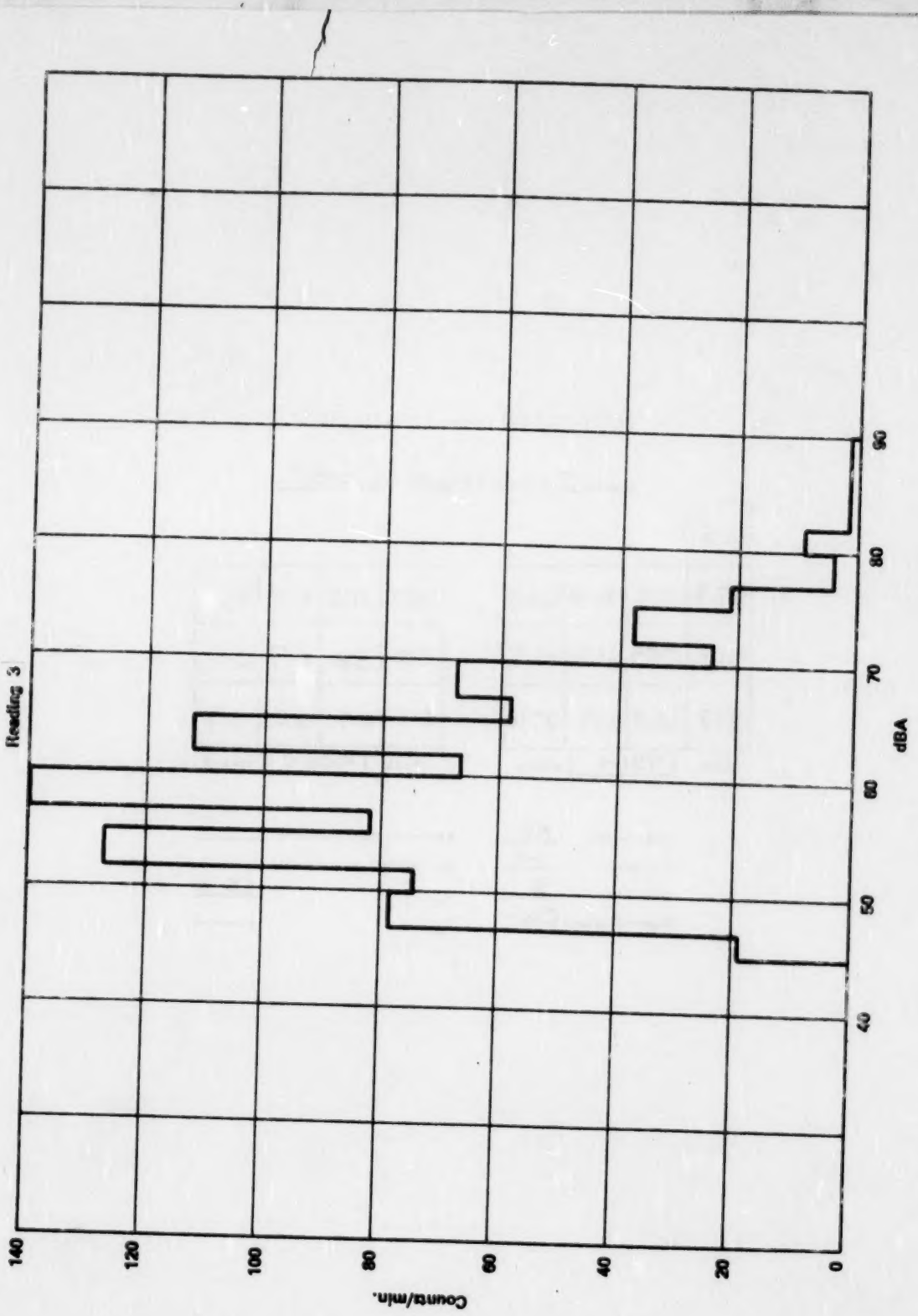
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 67.30

$L_{dn}$ _____


Reading 3
140
120
100
80
60
40
20
0
Counts/min.
90
80
70
60
50
40
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 4 Date 3Feb74 Time 0700

| | | | |
|---|---|---|---|
| 0.6 | | | |
| 5.8 | 9.0 | 8.0 | 11.9 |
| 4.6 | 5.1 | 2.3 | 3.8 |
| 2.0 | 2.3 | 1.1 | 1.9 |

45 dBA 58.8 minutes

| | | | |
|---|---|---|---|
| 1.0 | 0.8 | 0.3 | 0.7 |
| 0.2 | 0.2 | 0.1 | 0.0 |
| 0.0 | 0.0 | 0.0 | 0.0 |

70 dBA 58.8 minutes

Wind Direction _____

Wind Speed _____

Temperature _____

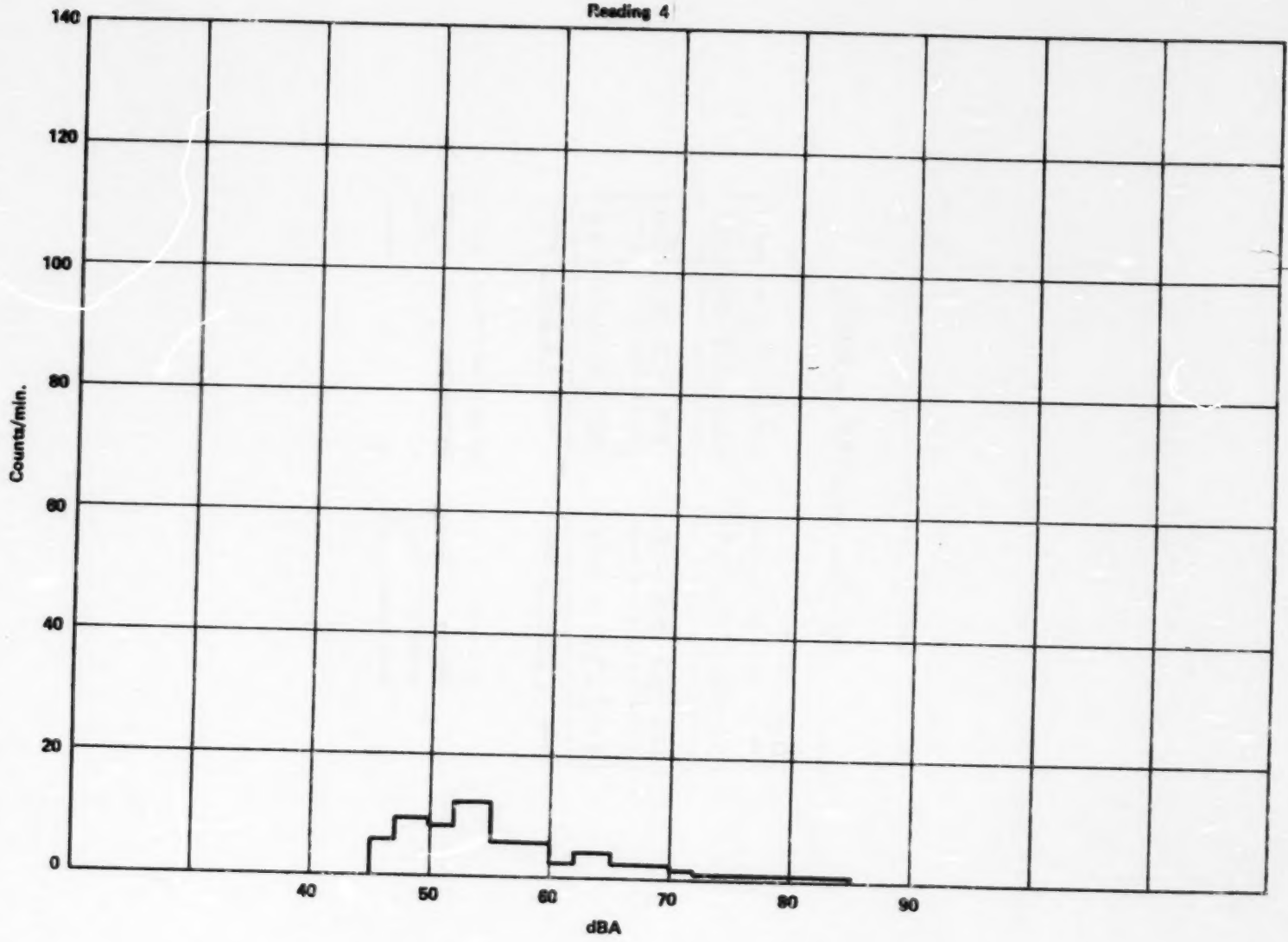
Weather Conditions _____

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ Y

$L_{dn}$ _____


Reading 4
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 5 Date 3Feb74 Time 2154

| | | | |
|---|---|---|---|
| 0.0 | | | |
| 1.8 | 10.6 | 23.0 | 69.5 |
| 43.1 | 84.3 | 49.2 | 95.6 |
| 50.1 | 69.4 | 29.5 | 39.5 |

45 dBA 565.3 minutes

| | | | |
|---|---|---|---|
| 34.3 | 26.4 | 4.9 | 7.3 |
| 1.9 | 2.3 | 0.6 | 0.3 |
| 0.0 | 0.0 | 0.1 | 0.0 |

70 dBA 565.3 minutes

Wind Direction NNW

Wind Speed 8-10

Temperature 19

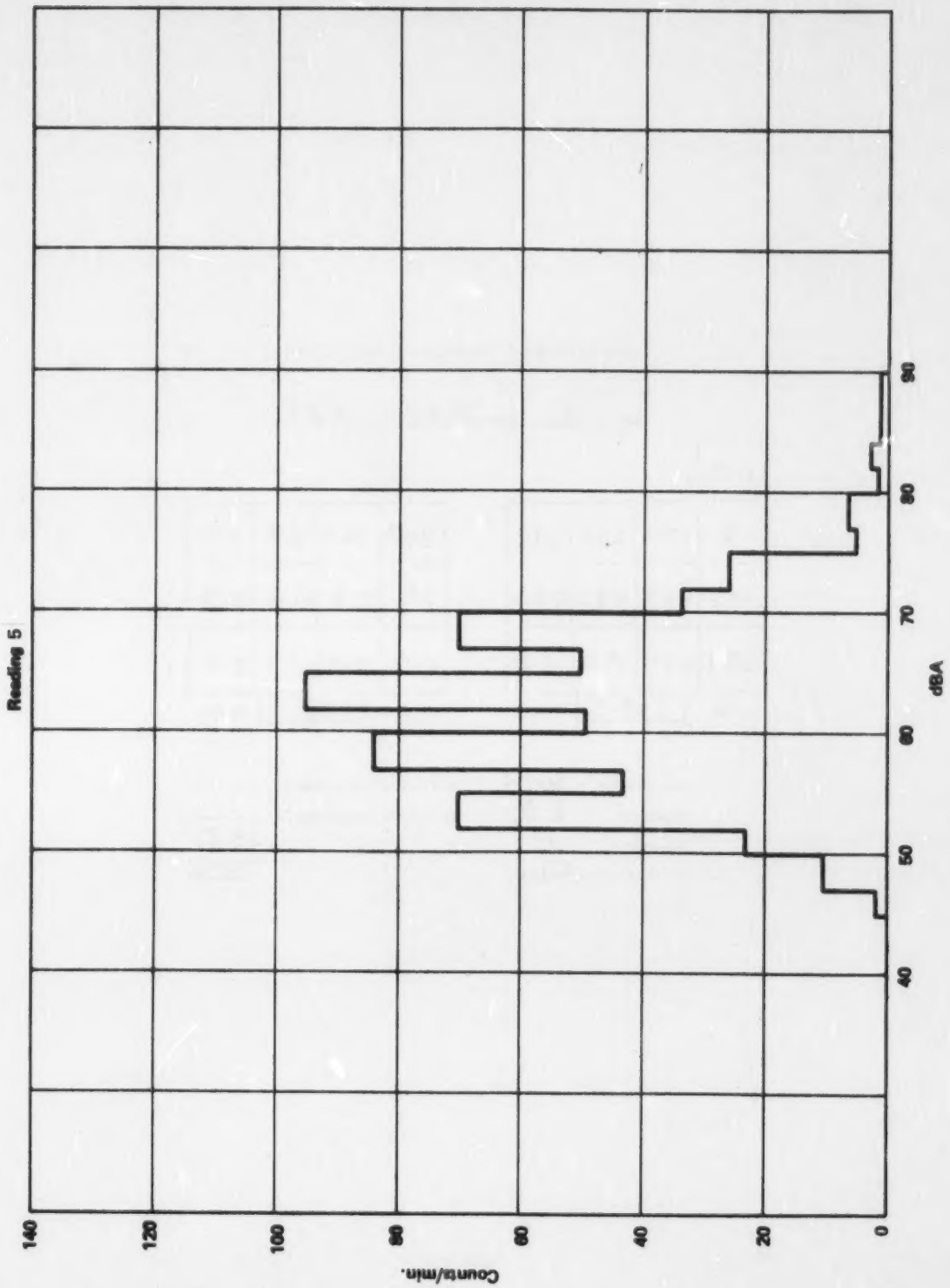
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 68.85

$L_{dn}$ 74.42


Reading 5
Counts/min.
140
120
100
80
60
40
20
0
dBA
90
80
70
60
50
40

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 6 Date 4Feb74 Time 0656

| | | | |
|---|---|---|---|
| 0.0 | | | |
| 3.3 | 48.6 | 820 | 1734 |
| 36.2 | 46.7 | 19.0 | 35.3 |
| 14.7 | 19.2 | 10.0 | 23.8 |

65 dBA 511.4 minutes

| | | | |
|---|---|---|---|
| 10.1 | 9.7 | 2.5 | 5.5 |
| 2.5 | 3.1 | 1.0 | 0.5 |
| 0.1 | 0.0 | 0.0 | 0.1 |

70 dBA 511.4 minutes

Wind Direction 14

Wind Speed 8-11

Temperature 14

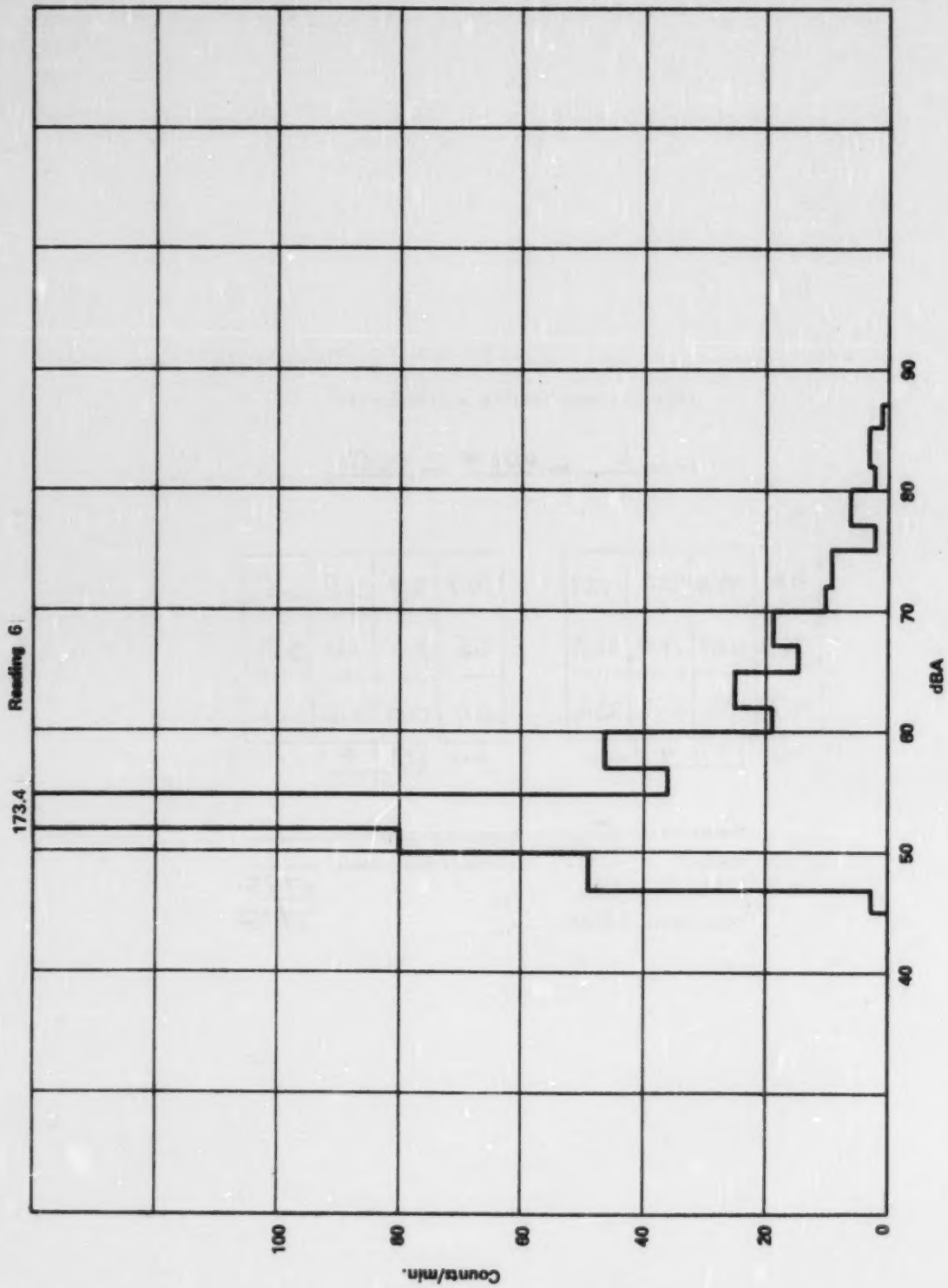
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 67.85

$L_{dn}$ 74.92


Reading 6
173.4
Counts/min.
100
80
60
40
20
0
dBA
90
80
70
60
50
40

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 7 Date 4Feb74 Time 2152

| | | | | |
|---|---|---|---|---|
| 18.1 | | | | |
| 18.7 | 64.7 | 109.0 | 121.9 | |
| 60.7 | 100.5 | 49.4 | 95.2 | |
| 49.7 | 71.2 | 31.6 | 62.9 | |
| 45 dBA | 858.8 | minutes | | |

| | | | |
|---|---|---|---|
| 34.5 | 31.7 | 6.8 | 15.0 |
| 5.4 | 6.4 | 2.0 | 0.7 |
| 0.0 | 0.0 | 0.1 | 0.1 |
| 70 dBA | 858.8 | minutes | |

Wind Direction ESE

Wind Speed 6-8

Temperature 22

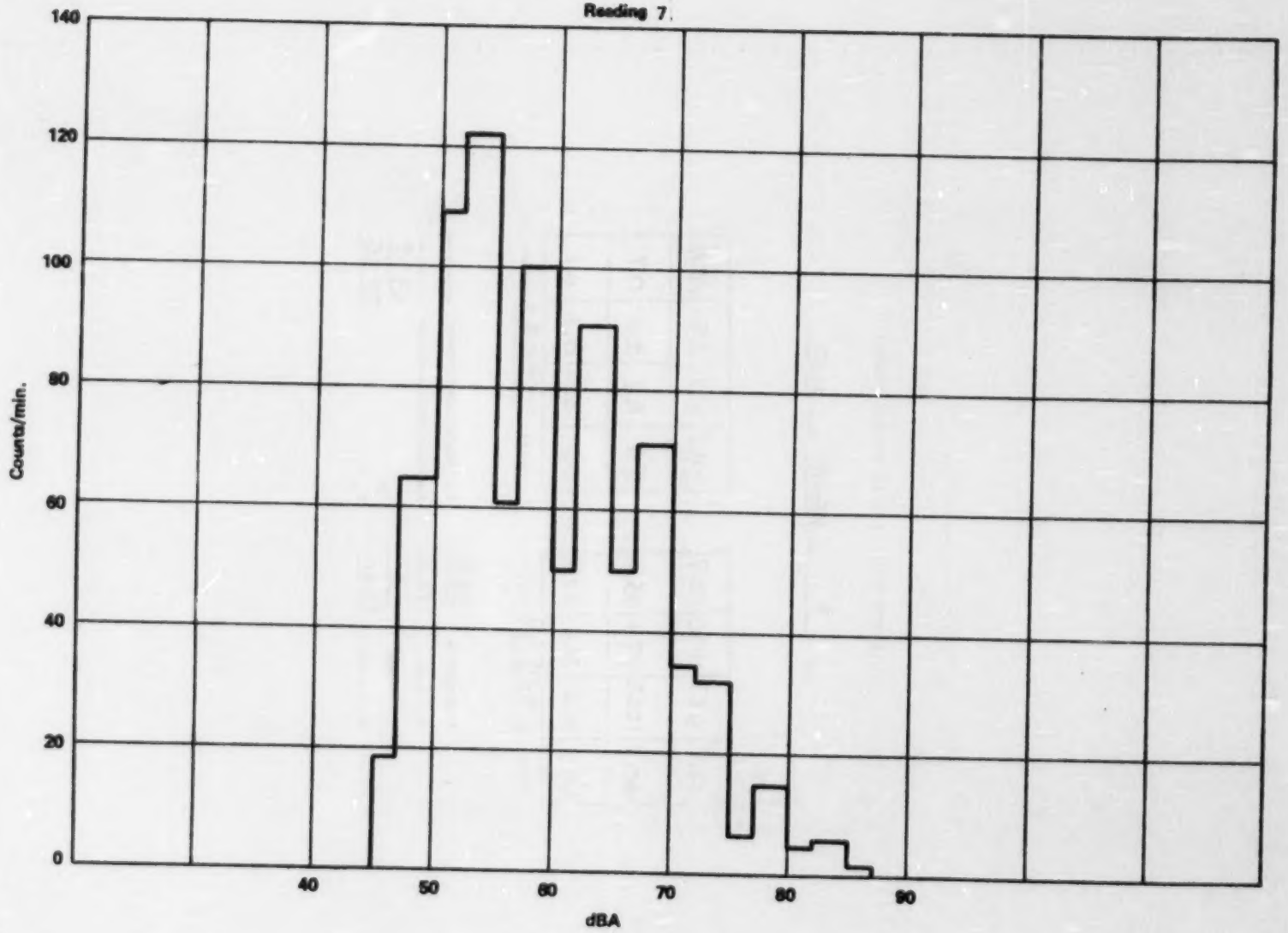
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 69.33

$L_{dn}$ 72.36


Reading 7.
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 8 Date 5Feb74 Time 0700

| | | | |
|---|---|---|---|
| 0.9 | | | |
| 20.1 | 79.9 | 76.0 | 87.6 |
| 20.7 | 24.4 | 7.7 | 11.4 |
| 4.9 | 4.9 | 2.2 | 7.3 |

45 dBA 349.3 minutes

| | | | |
|---|---|---|---|
| 2.0 | 1.9 | 0.6 | 2.8 |
| 1.5 | 1.2 | 0.3 | 0.1 |
| 0.0 | 0.1 | 0.1 | 0.0 |

70 dBA 349.3 minutes

Wind Direction ESE

Wind Speed 12-16

Temperature 21

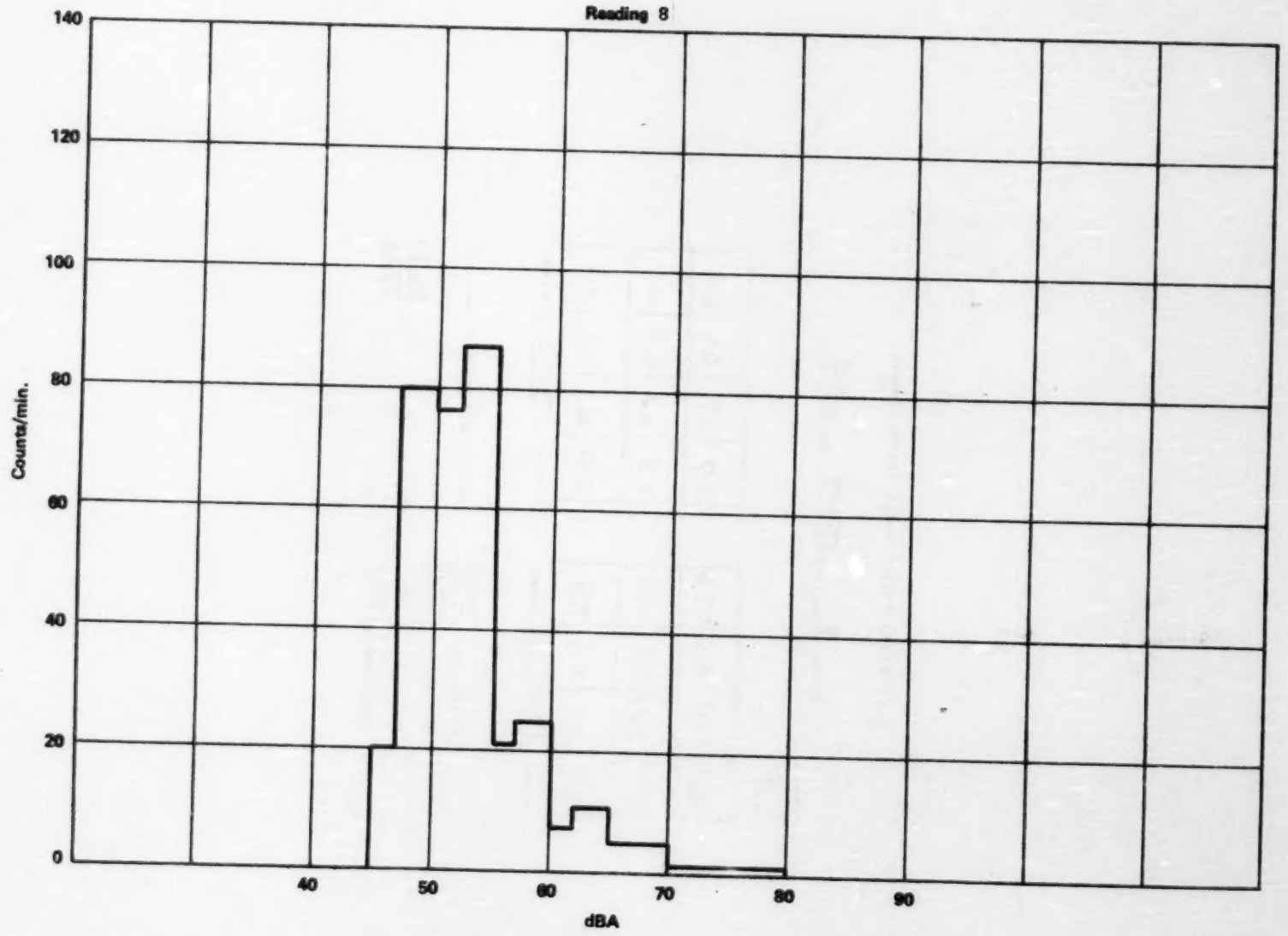
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 66.90

$L_{dn}$ 72.36


Reading 8
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 9 Date 5Feb74 Time 2156

| | | | |
|---|---|---|---|
| 8.2 | | | |
| 12.8 | 50.7 | 48.0 | 77.7 |
| 41.4 | 58.7 | 24.1 | 40.9 |
| 21.2 | 22.5 | 8.3 | 17.3 |

45 dBA 433.8 minutes

| | | | |
|---|---|---|---|
| 10.2 | 7.5 | 1.6 | 5.0 |
| 2.3 | 2.2 | 0.5 | 0.1 |
| 0.1 | 0.0 | 0.0 | 0.0 |

70 dBA 433.8 minutes

Wind Direction ESE

Wind Speed 7-9

Temperature 30

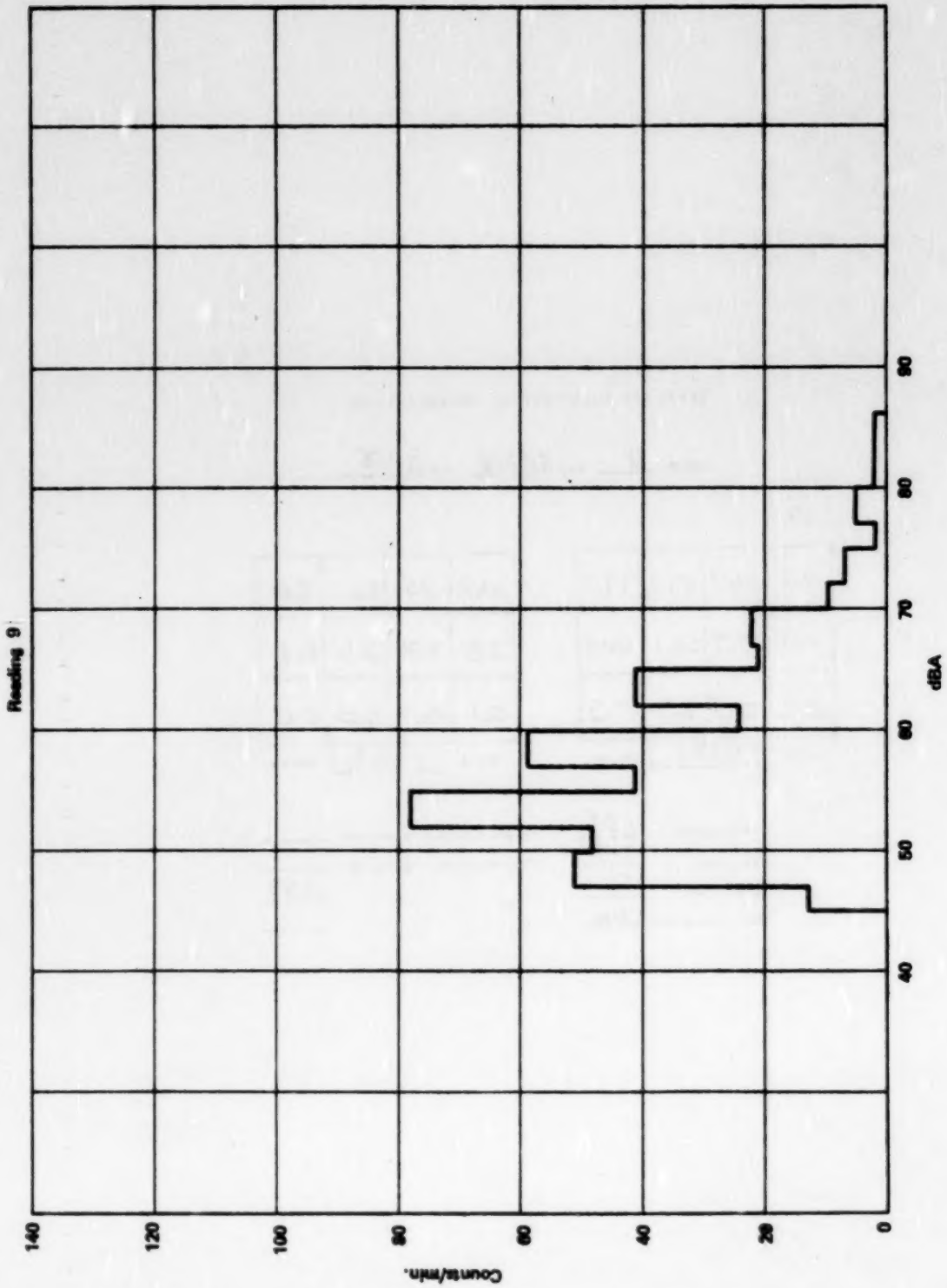
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 67.28

$L_{dn}$ _____


Reading 9
Counts/min.
140
120
100
80
60
40
20
0
dBA
90
80
70
60
50
40

## LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 10 Date 6 Feb 74 Time 0659

| | | | |
|---|---|---|---|
| 150.1 | | | |
| 50.5 | 83.0 | 54.8 | 62.0 |
| 32.9 | 42.2 | 15.3 | 25.6 |
| 11.8 | 13.1 | 5.3 | 15.9 |

45 dBA 532.5 minutes

| | | | |
|---|---|---|---|
| 0.1 | 5.4 | 1.4 | 5.4 |
| 2.5 | 2.4 | 0.4 | 0.3 |
| 0.1 | 0.0 | 0.0 | 0.0 |

70 dBA 532.5 minutes

Wind Direction _____

Wind Speed _____

Temperature 31

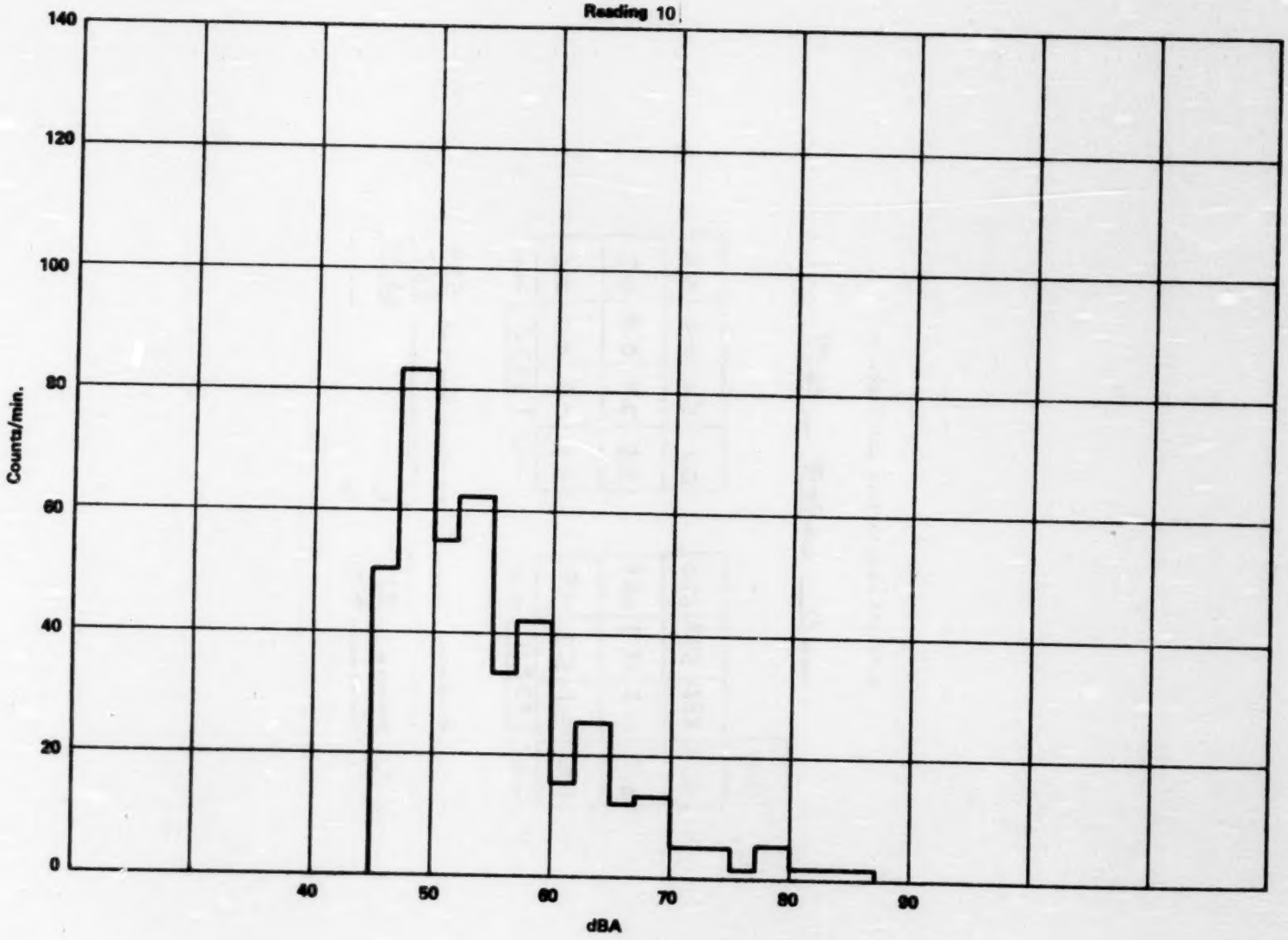
Weather Conditions Rain

Raw Vehicle Count Northbound 584

Raw Vehicle Count Southbound 557

$L_{eq}$ 65.30

$L_{dn}$ _____


Reading 10
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 11 Date 7 Feb 74 Time 1310

1.1

| | | | |
|---|---|---|---|
| 6.5 | 21.3 | 50.0 | 29.3 |
| 39.3 | 67.4 | 33.1 | 55.4 |
| 28.7 | 37.3 | 17.0 | 38.4 |

45 dBA 431.1 minutes

| | | | |
|---|---|---|---|
| 19.9 | 19.1 | 4.4 | 11.6 |
| 4.0 | 3.7 | 1.1 | 0.5 |
| 0.1 | 0.1 | 0.1 | 0.0 |

70 dBA 431.1 minutes

Wind Direction NNE

Wind Speed 67

Temperature 18

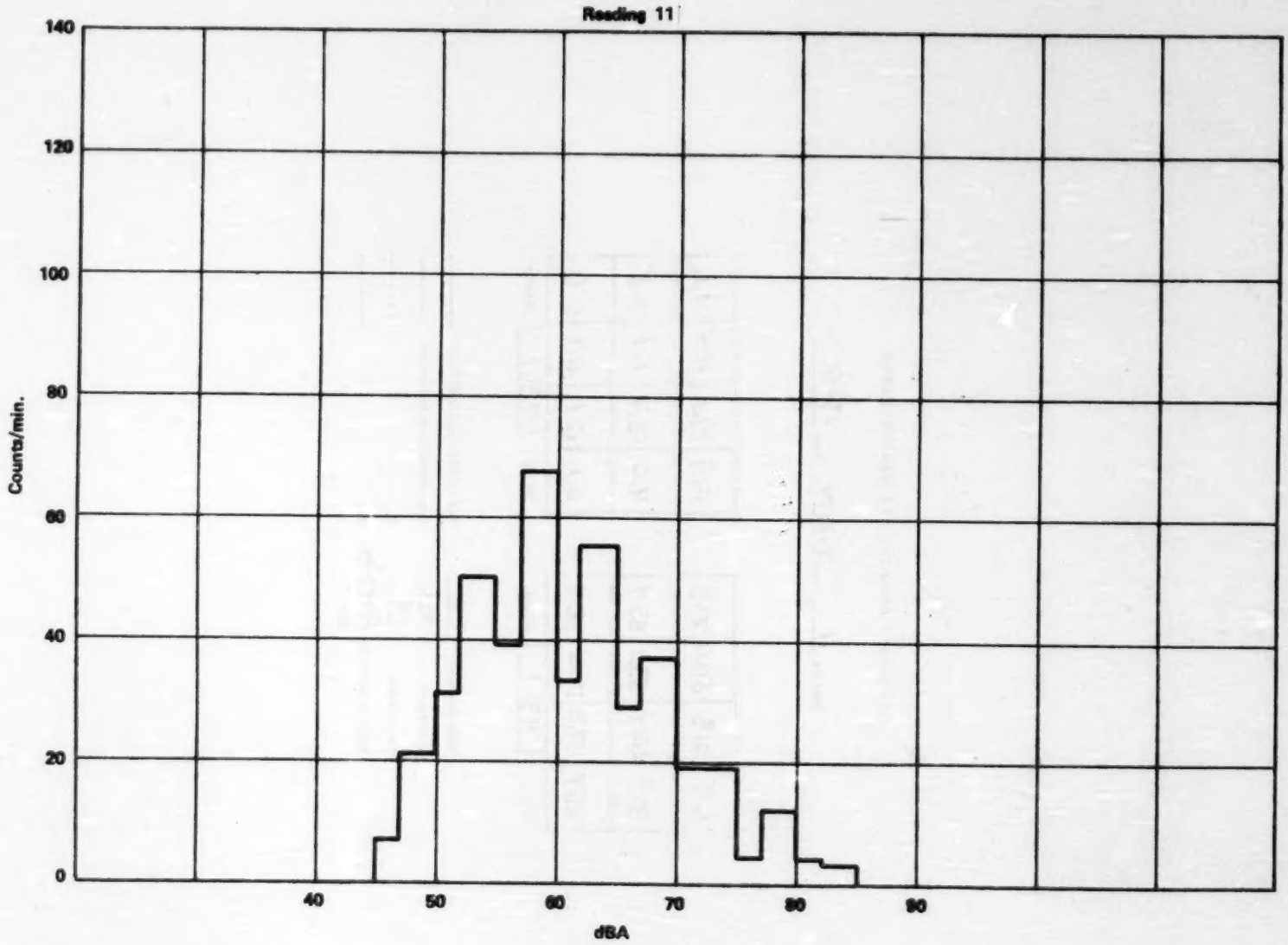
Weather Conditions Freezing Rain

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ _____

$L_{dn}$ _____


Reading 11
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 12 Date 7 Feb 74 Time 2220

| | | | |
|---|---|---|---|
| 25.8 | | | |
| 11.5 | 31.6 | 130.0 | 77.0 |
| 70.3 | 121.6 | 52.2 | 114.7 |
| 57.7 | 76.6 | 35.1 | 97.1 |

45 dBA 894.1 minutes

| | | | |
|---|---|---|---|
| 36.7 | 36.6 | 9.3 | 23.8 |
| 8.4 | 9.0 | 2.2 | 0.9 |
| 0.1 | 0.1 | 0.1 | 0.0 |

70 dBA 894.1 minutes

Wind Direction NE

Wind Speed 6-8

Temperature 18

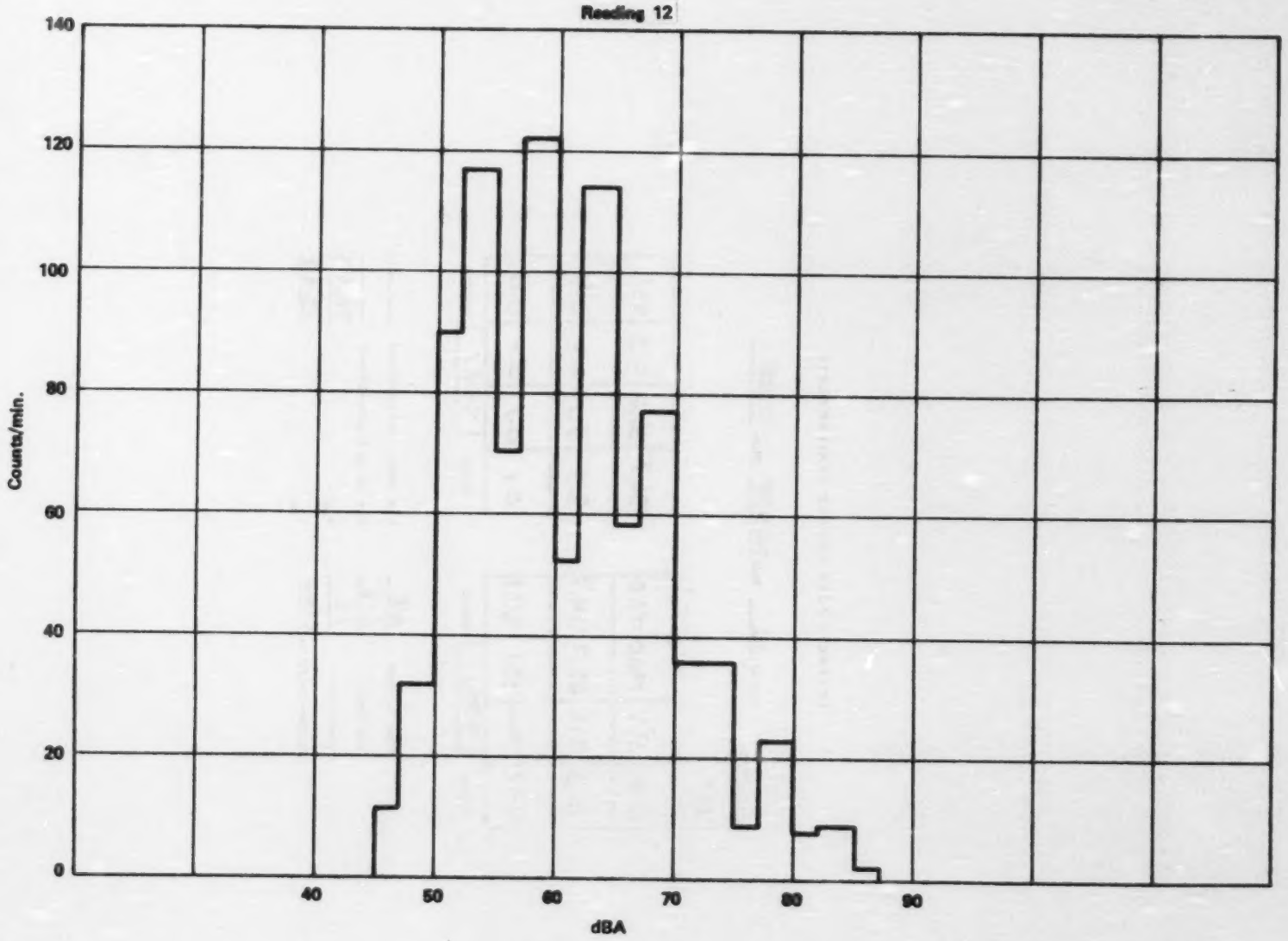
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 70.43

$L_{dn}$ 75.69


Reading 12
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 13 Date 8Feb74 Time 0727

152.6

| | | | |
|---|---|---|---|
| 22.7 | 39.6 | 51.2 | 62.0 |
| 28.4 | 41.3 | 17.3 | 37.0 |
| 18.5 | 24.2 | 11.3 | 31.1 |

45 dBA 538.9 minutes

| | | | |
|---|---|---|---|
| 11.9 | 11.8 | 3.4 | 9.6 |
| 3.9 | 3.1 | 0.6 | 0.3 |
| 0.0 | 0.0 | 0.1 | 0.0 |

70 dBA 538.9 minutes

Wind Direction NNE

Wind Speed 5-6

Temperature 15

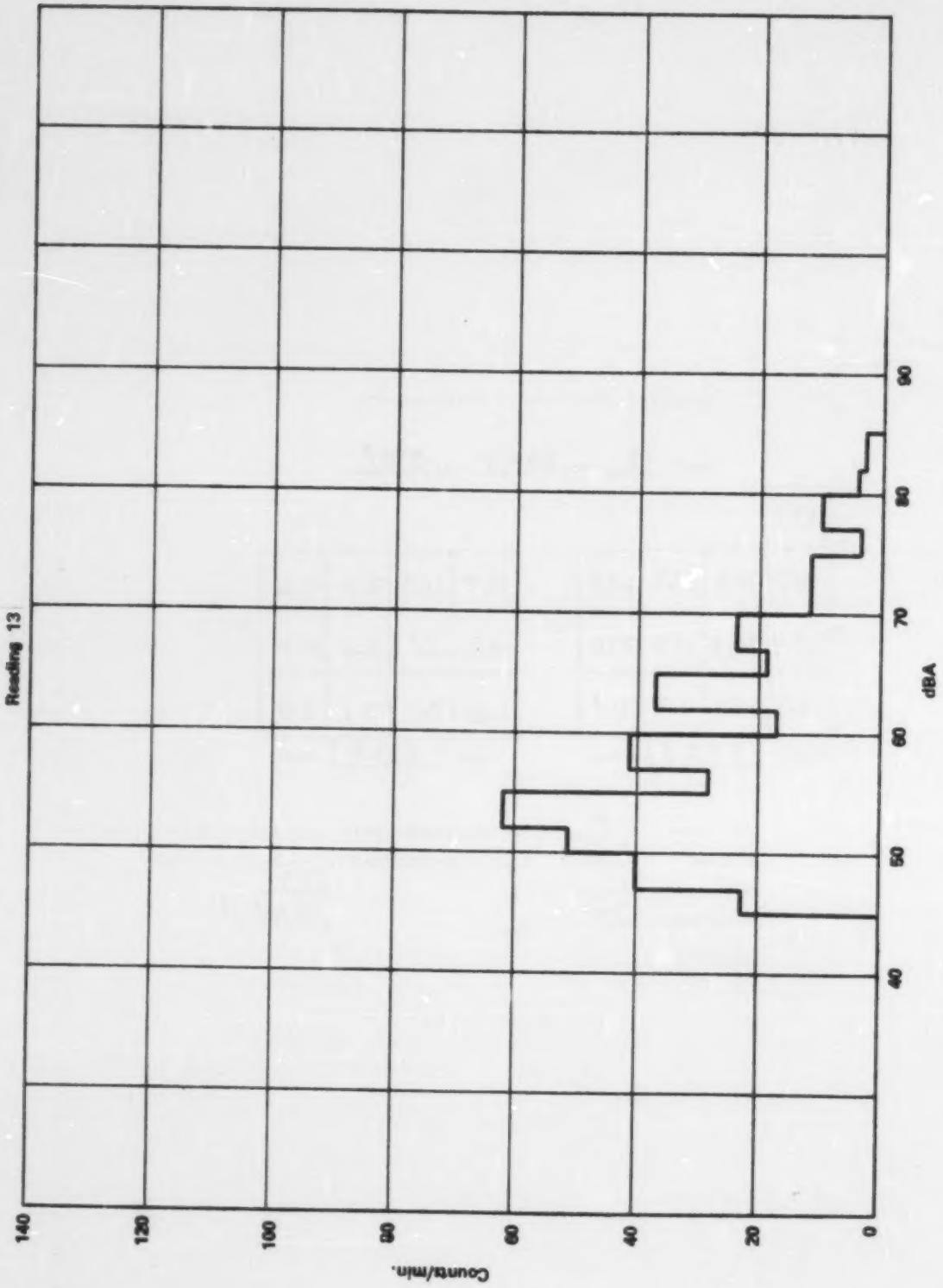
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 68.34

$L_{dn}$ 75.64


Reading 13
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 14 Date 8Feb74 Time 2147

5.8

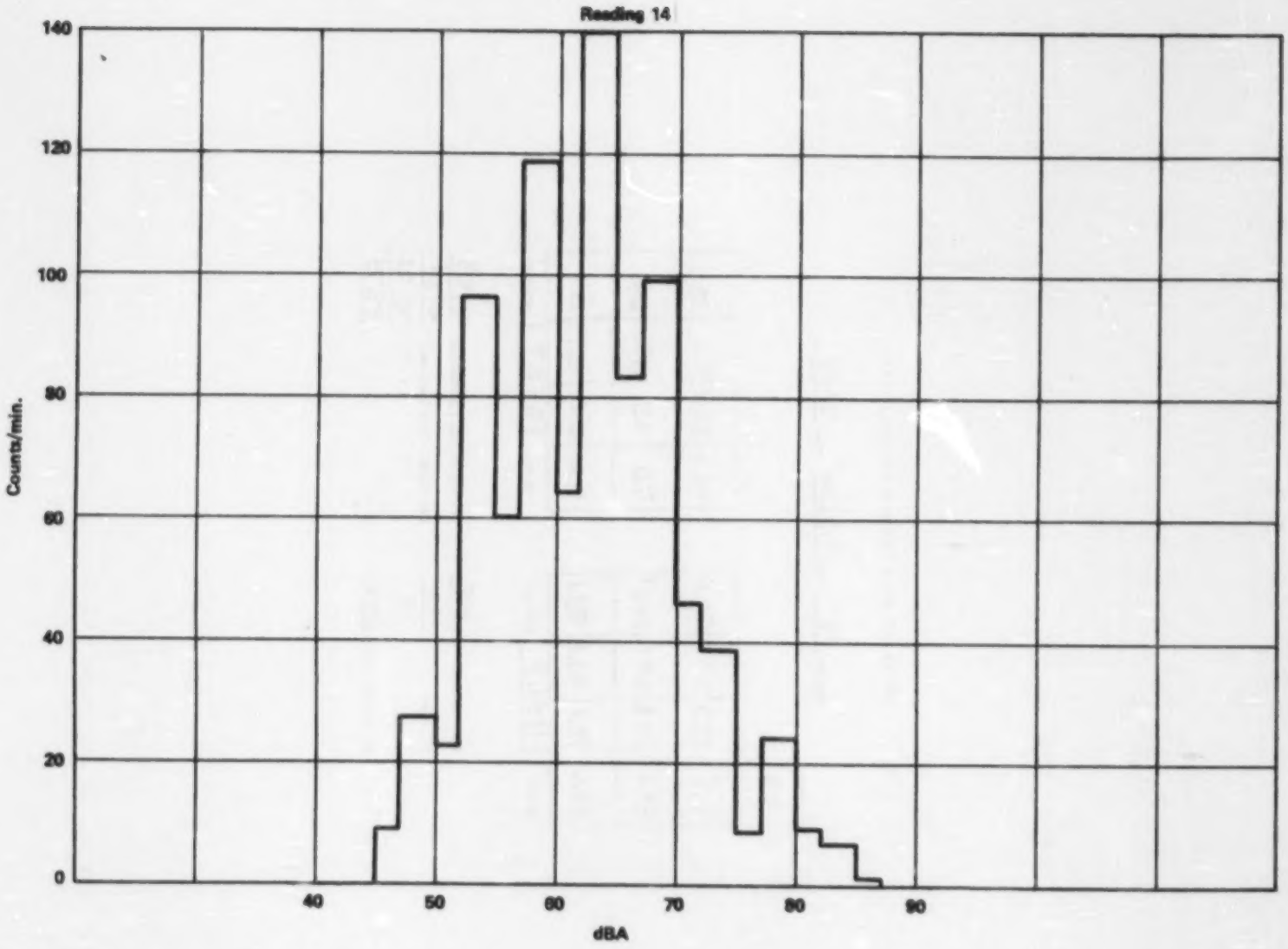
| | | | |
|---|---|---|---|
| 8.5 | 27.3 | 22.1 | 96.0 |
| 59.8 | 117.8 | 64.1 | 140.8 |
| 82.6 | 98.1 | 40.1 | 83.1 |

45 dBA 852.7 minutes

| | | | |
|---|---|---|---|
| 45.8 | 38.4 | 9.2 | 23.9 |
| 9.0 | 7.3 | 1.2 | 0.6 |
| 0.0 | 0.0 | 0.1 | 0.1 |

70 dBA 852.7 minutes

| | | | |
|---|---|---|---|
| Wind Direction | NE | Raw Vehicle Count Northbound | 4483 |
| Wind Speed | 4-6 | Raw Vehicle Count Southbound | 4984 |
| Temperature | 19 | $L_{eq}$ | 70.26 |
| Weather Conditions | Clear | $L_{dn}$ | 7375 |


Reading 14
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 15 Date 9 Feb 74 Time 0707

154.4

| | | | |
|---|---|---|---|
| 21.6 | 41.3 | 36.0 | 93.8 |
| 33.6 | 45.4 | 18.0 | 41.2 |
| 18.0 | 20.7 | 8.0 | 21.5 |

45 dBA 555.4 minutes

| | | | |
|---|---|---|---|
| 8.7 | 9.3 | 2.4 | 6.6 |
| 2.3 | 1.9 | 0.5 | 0.3 |
| 0.1 | 0.0 | 0.0 | 0.1 |

70 dBA 555.4 minutes

Wind Direction 0

Wind Speed 0

Temperature 22

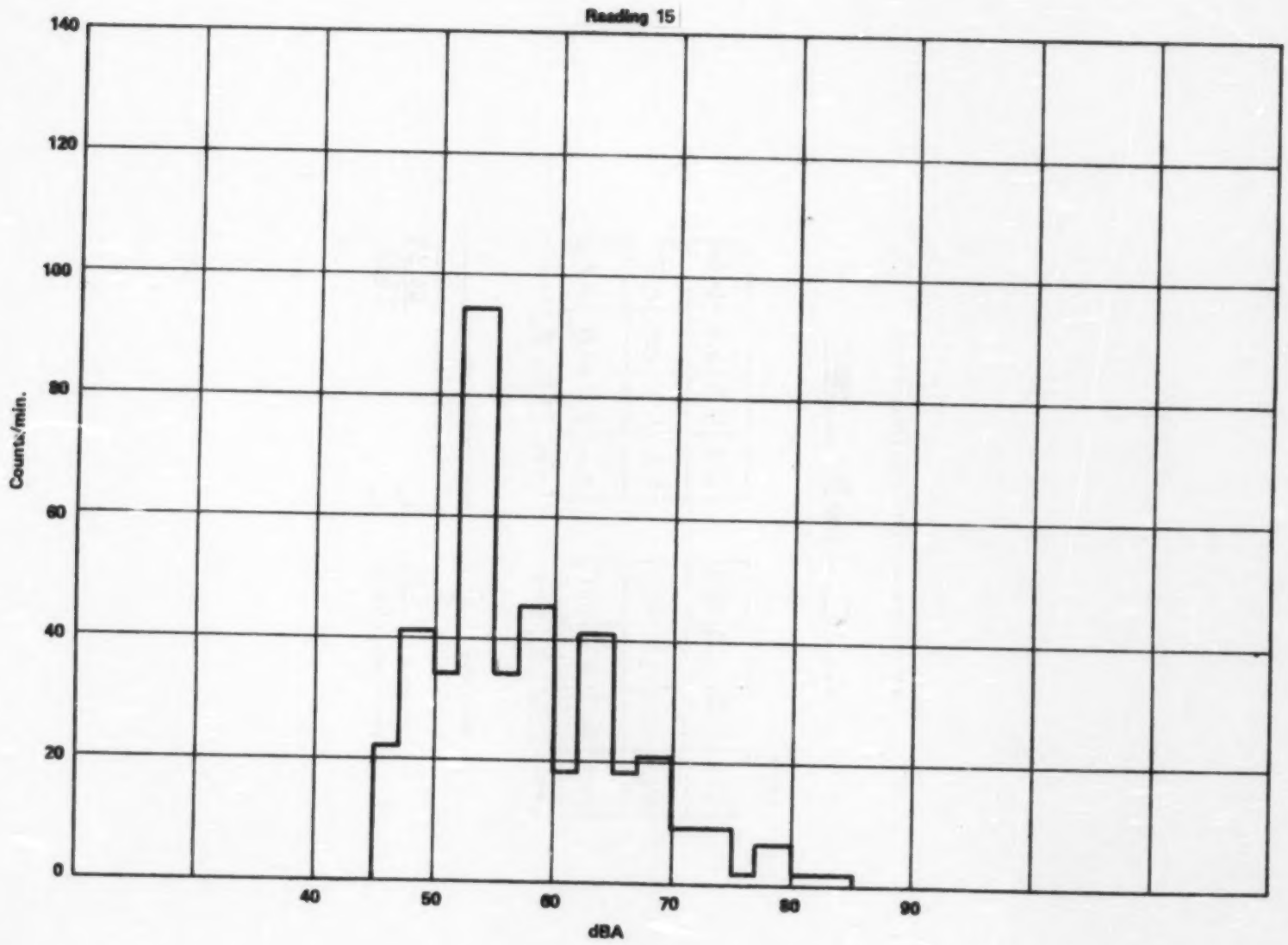
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 66.59

$L_{dn}$ 73.75


Reading 15
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 16 Date 9Feb 74 Time 2154

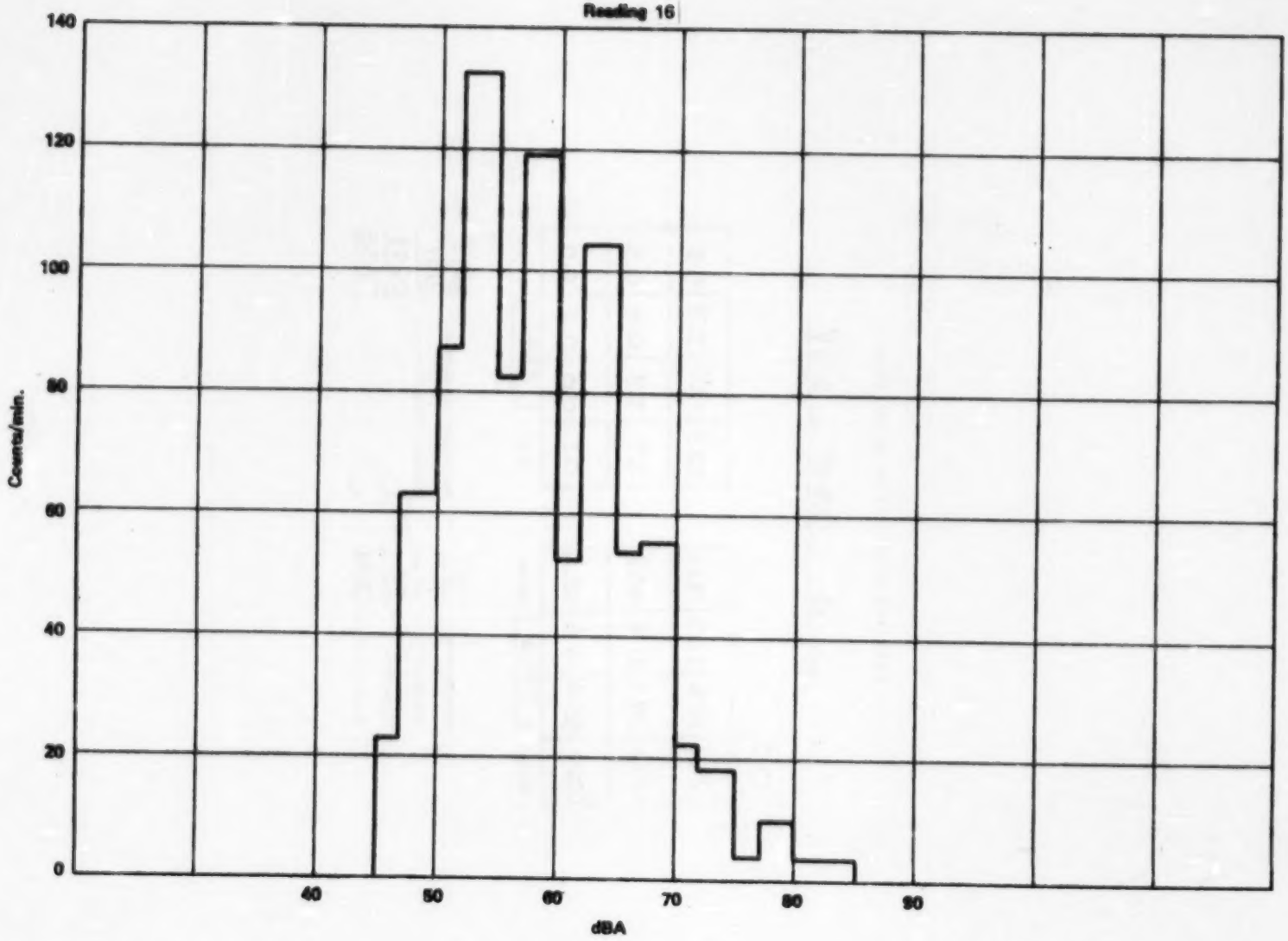
| | | | |
|---|---|---|---|
| 53.0 | | | |
| 23.1 | 62.8 | 86.8 | 132.0 |
| 81.6 | 119.3 | 51.8 | 103.8 |
| 53.9 | 55.0 | 19.5 | 35.6 |

45 dBA 881.6 minutes

| | | | |
|---|---|---|---|
| 22.5 | 17.7 | 3.7 | 9.5 |
| 3.7 | 3.4 | 0.6 | 0.3 |
| 0.1 | 0.0 | 0.0 | 0.0 |

70 dBA 881.6 minutes

| | | | |
|---|---|---|---|
| Wind Direction | 0 | Raw Vehicle Count Northbound | 3657 |
| Wind Speed | 0 | Raw Vehicle Count Southbound | 4191 |
| Temperature | 32 | $L_{eq}$ | 66.91 |
| Weather Conditions | Clear | $L_{dn}$ | 71.35 |


Reading 16
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 17 Date 10Feb74 Time 0658

168.7

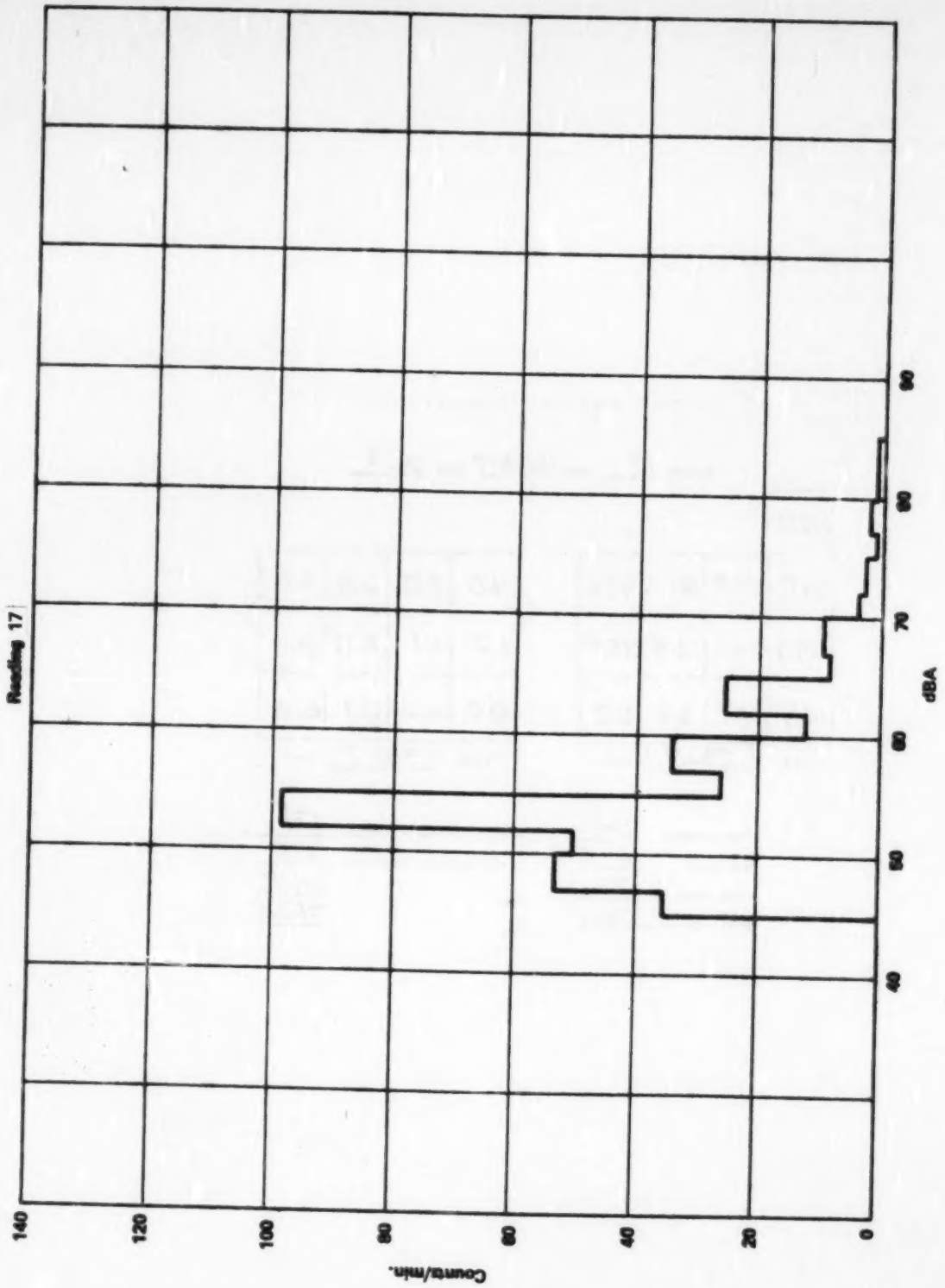
| | | | |
|---|---|---|---|
| 34.8 | 52.9 | 50.0 | 97.6 |
| 25.7 | 34.3 | 12.5 | 25.4 |
| 10.9 | 11.7 | 3.4 | 8.2 |

45 dBA 536.7 minutes

| | | | |
|---|---|---|---|
| 4.0 | 3.0 | 0.9 | 2.2 |
| 1.2 | 1.1 | 0.2 | 0.1 |
| 0.0 | 0.0 | 0.1 | 0.0 |

70 dBA 536.7 minutes

| | | | |
|---|---|---|---|
| Wind Direction | SW | Raw Vehicle Count Northbound | 631 |
| Wind Speed | 10-12 | Raw Vehicle Count Southbound | 448 |
| Temperature | 28 | $L_{eq}$ | 64.51 |
| Weather Conditions | Clear | $L_{dn}$ | 71.35 |


Reading 17
140
120
100
80
60
40
20
0
Counts/min.
90
80
70
60
50
40
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 18 Date 10Feb74 Time 2220

0.0

| | | | |
|---|---|---|---|
| 10.9 | 28.5 | 58.1 | 78.0 |
| 50.9 | 80.6 | 41.6 | 70.6 |
| 40.0 | 39.9 | 21.3 | 24.6 |

45 dBA 535.7 minutes

| | | | |
|---|---|---|---|
| 19.6 | 12.9 | 2.5 | 6.6 |
| 2.6 | 2.6 | 0.8 | 1.4 |
| 9.1 | 0.0 | 1.4 | 1.0 |

70 dBA 63.57 minutes

Wind Direction NNW

Wind Speed 10-12

Temperature 16

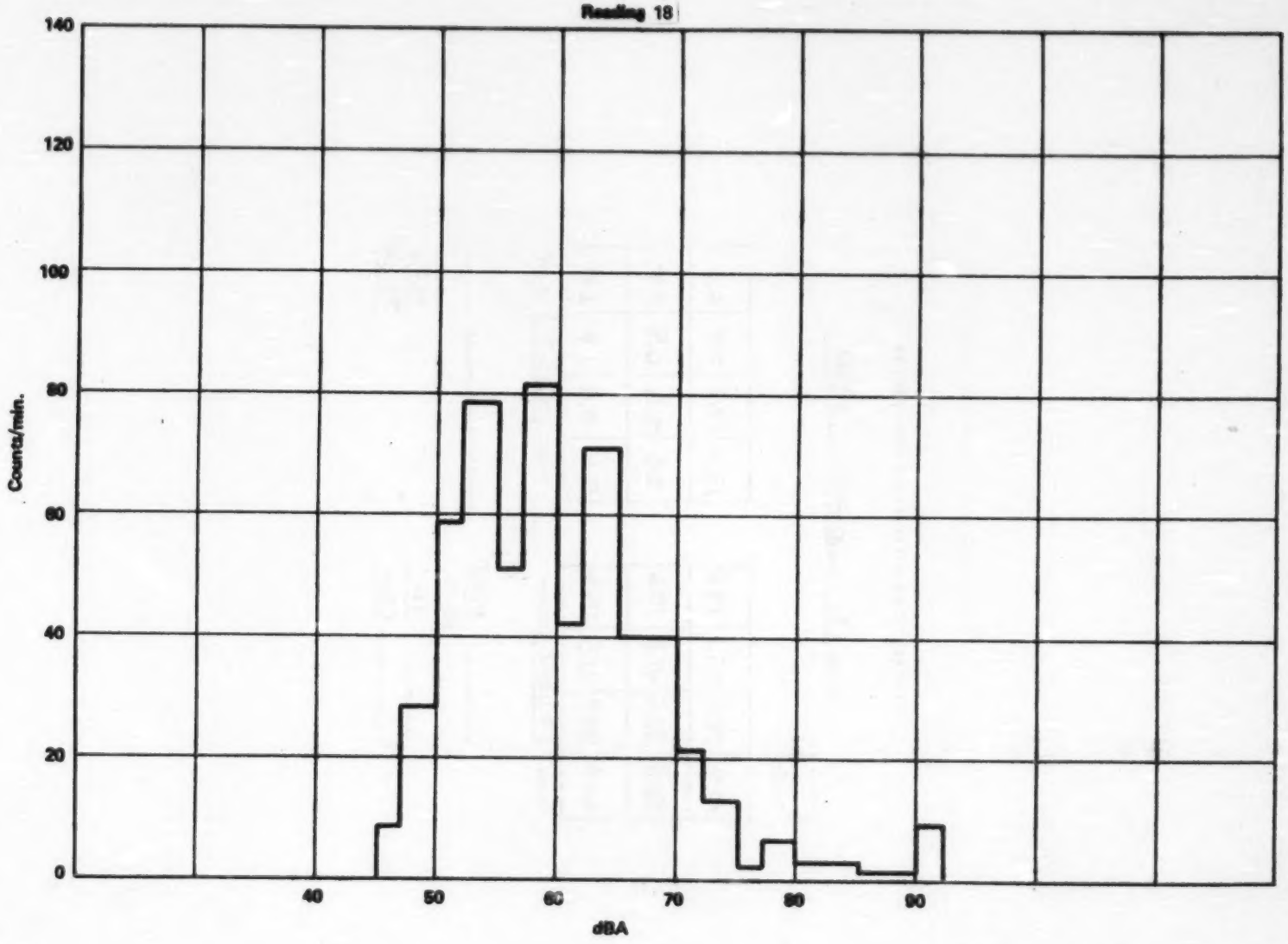
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 75.96

$L_{dn}$ 78.54


Reading 18
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 19 Date 11 Feb 74 Time 0707

| | | | |
|---|---|---|---|
| 71.3 | | | |
| 18.0 | 36.2 | 54.7 | 85.0 |
| 26.7 | 43.8 | 18.2 | 38.6 |
| 17.4 | 24.4 | 13.8 | 46.6 |

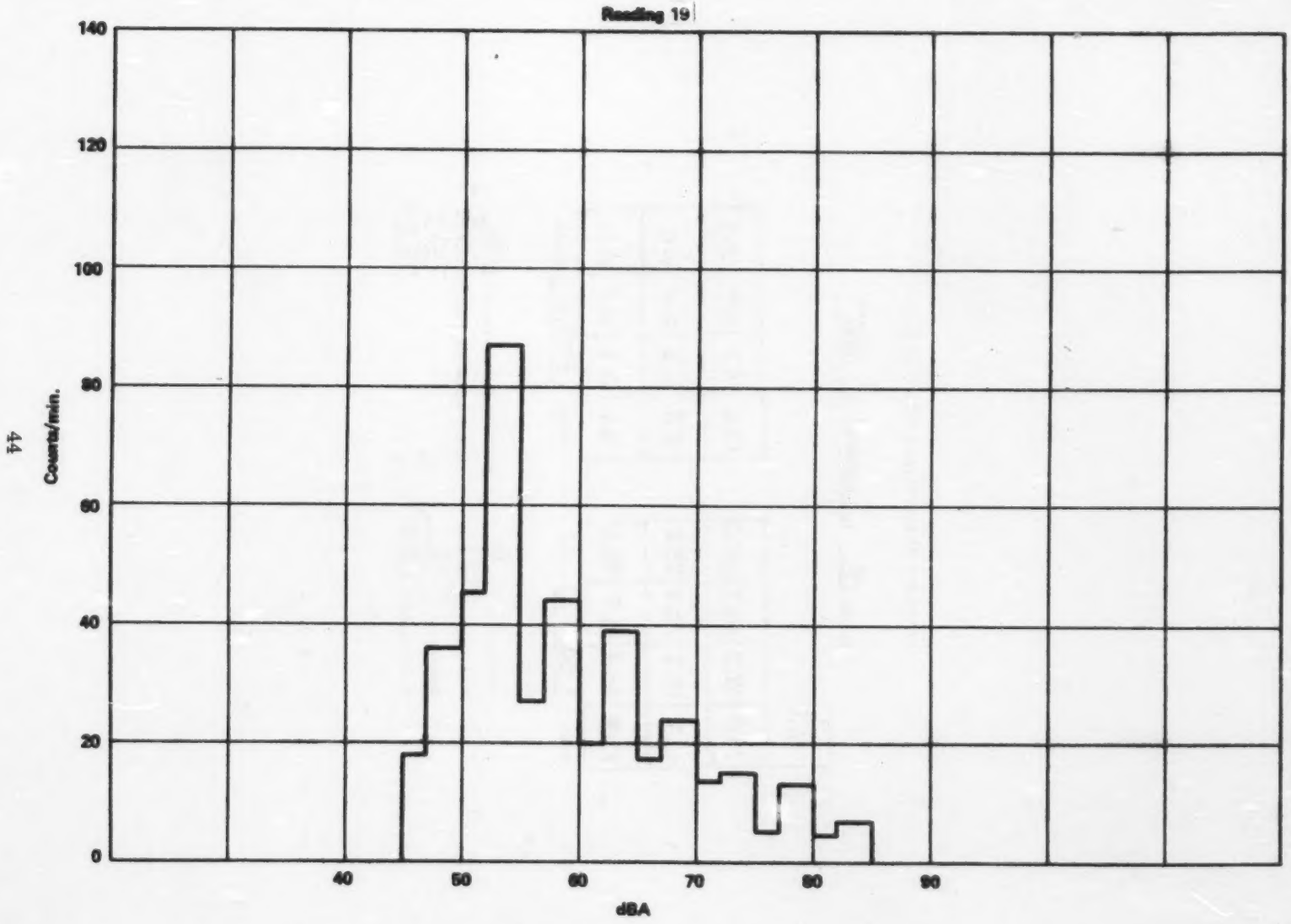
45 dBA 505.6 minutes

| | | | |
|---|---|---|---|
| 12.6 | 15.1 | 4.9 | 12.7 |
| 5.3 | 6.8 | 2.0 | 1.0 |
| 0.0 | 0.1 | 0.2 | 0.0 |

70 dBA 505.6 minutes

| | |
|---|---|
| Wind Direction | 0 |
| Wind Speed | 0 |
| Temperature | 15 |
| Weather Conditions | Clear |

| | |
|---|---|
| Raw Vehicle Count Northbound | 1196 |
| Raw Vehicle Count Southbound | 1200 |
| $L_{eq}$ | 71.25 |
| $L_{dn}$ | 78.54 |


Reading 19
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 20 Date 11Feb74 Time 2147

| | | | |
|---|---|---|---|
| 0.0 | | | |
| 5.2 | 26.4 | 20.0 | 10.5 |
| 70.9 | 132.9 | 73.1 | 137.1 |
| 78.5 | 97.6 | 42.1 | 79.6 |

45 dBA | 872.1 | minutes

| | | | |
|---|---|---|---|
| 47.0 | 37.6 | 8.4 | 21.4 |
| 8.1 | 8.2 | 1.9 | 0.7 |
| 0.0 | 0.1 | 0.1 | 0.0 |

70 dBA | 877.1 | minutes

Wind Direction SSW

Wind Speed 9-10

Temperature 33

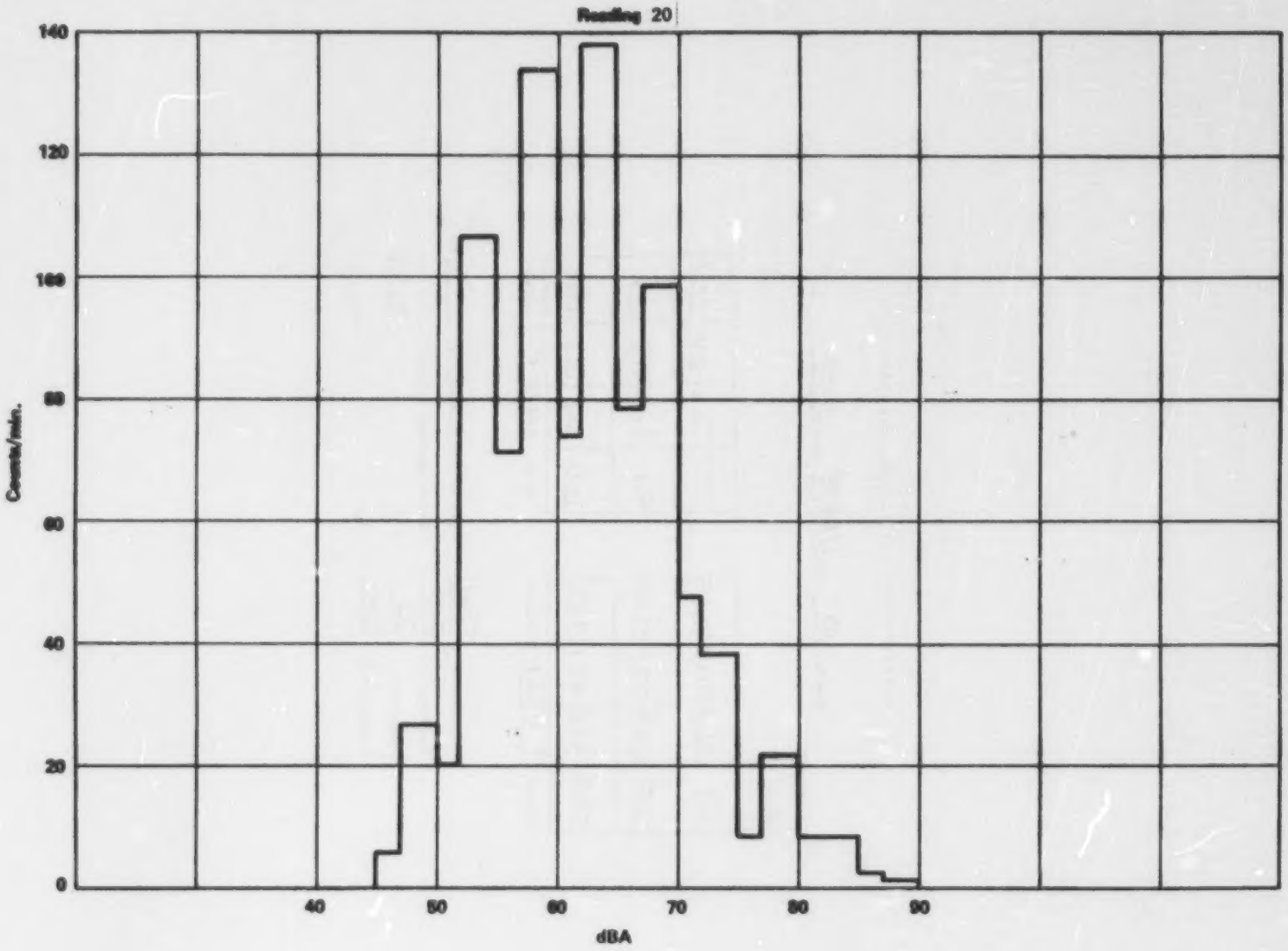
Weather Conditions Clear

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

$L_{eq}$ 70.37

$L_{dn}$ _____


Reading 20
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 21 Date 13 Feb 74 Time 0720

| | | | |
|---|---|---|---|
| 25.4 | | | |
| 100 | 340 | 24.2 | 60.0 |
| 370 | 66.4 | 33.7 | 67.9 |
| 36.5 | 53.2 | 29.1 | 71.8 |

45 dBA 534.2 minutes

| | | | |
|---|---|---|---|
| 29.6 | 32.5 | 7.2 | 18.3 |
| 6.6 | 8.3 | 2.4 | 1.3 |
| 0.0 | 0.1 | 0.1 | 0.1 |

70 dBA 554.2 minutes

Wind Direction S

Wind Speed 4-5

Temperature 31

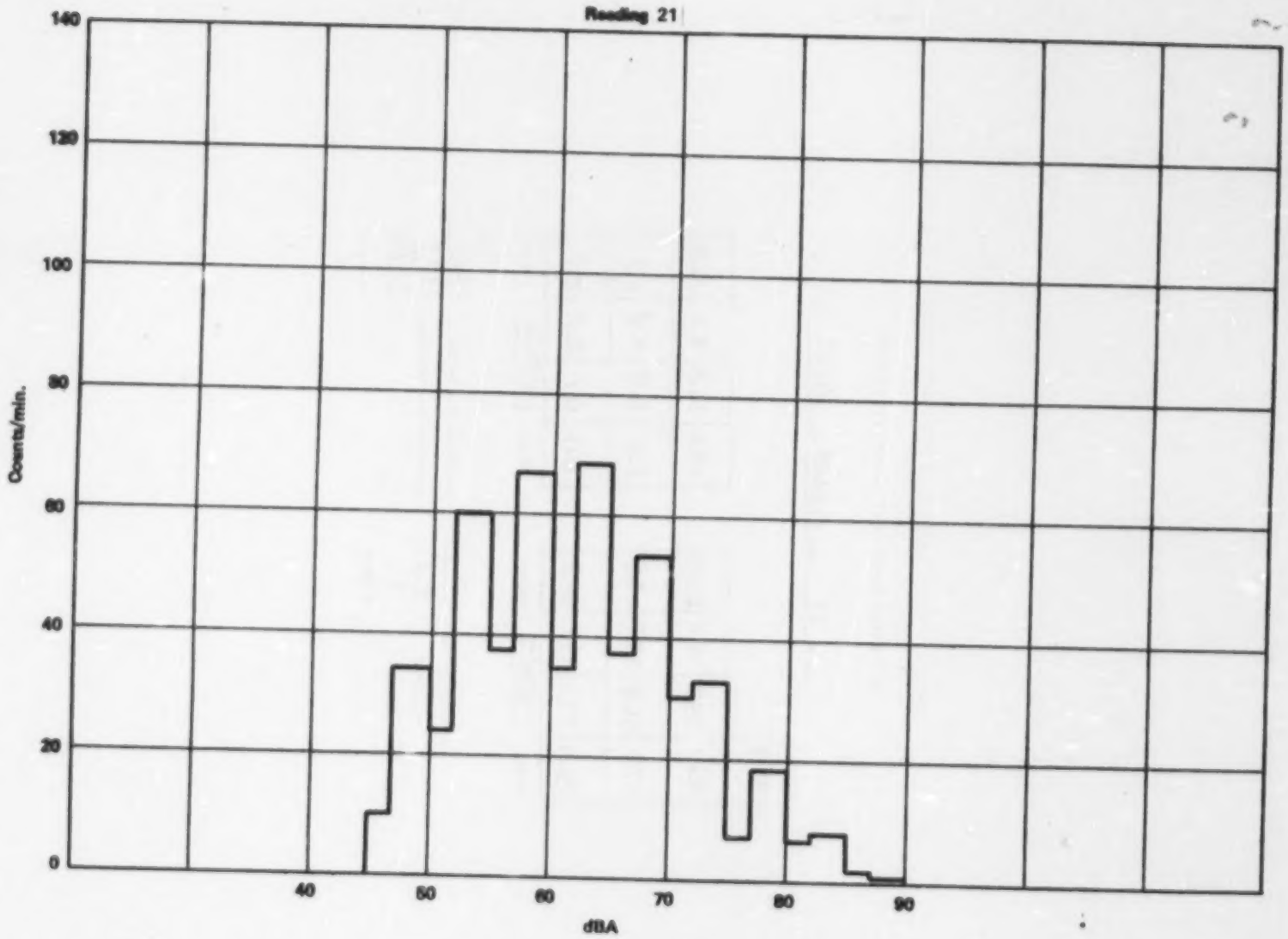
Weather Conditions Clear

Raw Vehicle Count Northbound 1365

Raw Vehicle Count Southbound 1284

$L_{eq}$ 71.94

$L_{dn}$ _____


Reading 21
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 22 Date 13Feb74 Time 2132

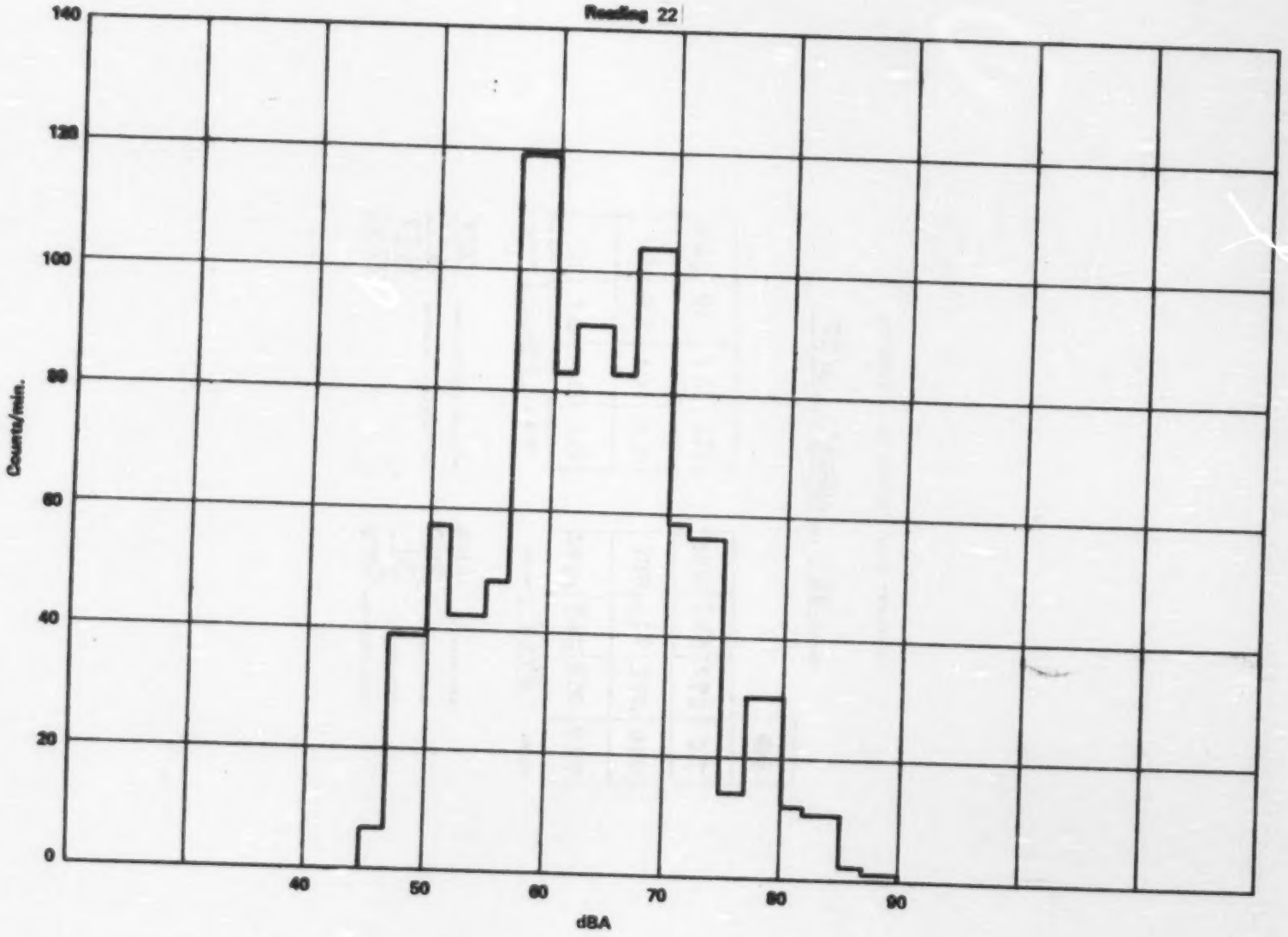
| | | | |
|---|---|---|---|
| 7.5 | 39.1 | 56.7 | 42.5 |
| 47.6 | 119.2 | 82.6 | 91.2 |
| 83.4 | 103.8 | 58.5 | 104.2 |

66 dBA 846.1 minutes

| | | | |
|---|---|---|---|
| 58.6 | 56.1 | 13.9 | 30.2 |
| 12.3 | 11.2 | 2.0 | 1.1 |
| 0.1 | 0.1 | 0.1 | 0.1 |

70 dBA 846.1 minutes

| | | | |
|---|---|---|---|
| Wind Direction | NNE | Raw Vehicle Count Northbound | 4219 |
| Wind Speed | 8-10 | Raw Vehicle Count Southbound | 4697 |
| Temperature | 31 | $L_{eq}$ | 71.72 |
| Weather Conditions | Clear | $L_{dn}$ | 77.90 |


Reading 22
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 23 Date MAR 74 Time 0715

| | | | |
|---|---|---|---|
| 50.9 | | | |
| 25.9 | 66.7 | 15.5 | 72.4 |
| 34.1 | 58.2 | 30.3 | 49.3 |
| 27.9 | 40.2 | 25.0 | 69.5 |

48 dBA 575.5 minutes

| | | | |
|---|---|---|---|
| 10.1 | 24.9 | 7.5 | 20.9 |
| 8.5 | 7.5 | 1.6 | 0.9 |
| 0.2 | 0.1 | 0.0 | 0.1 |

70 dBA 575.5 minutes

Wind Direction NNE

Wind Speed 4-7

Temperature 27

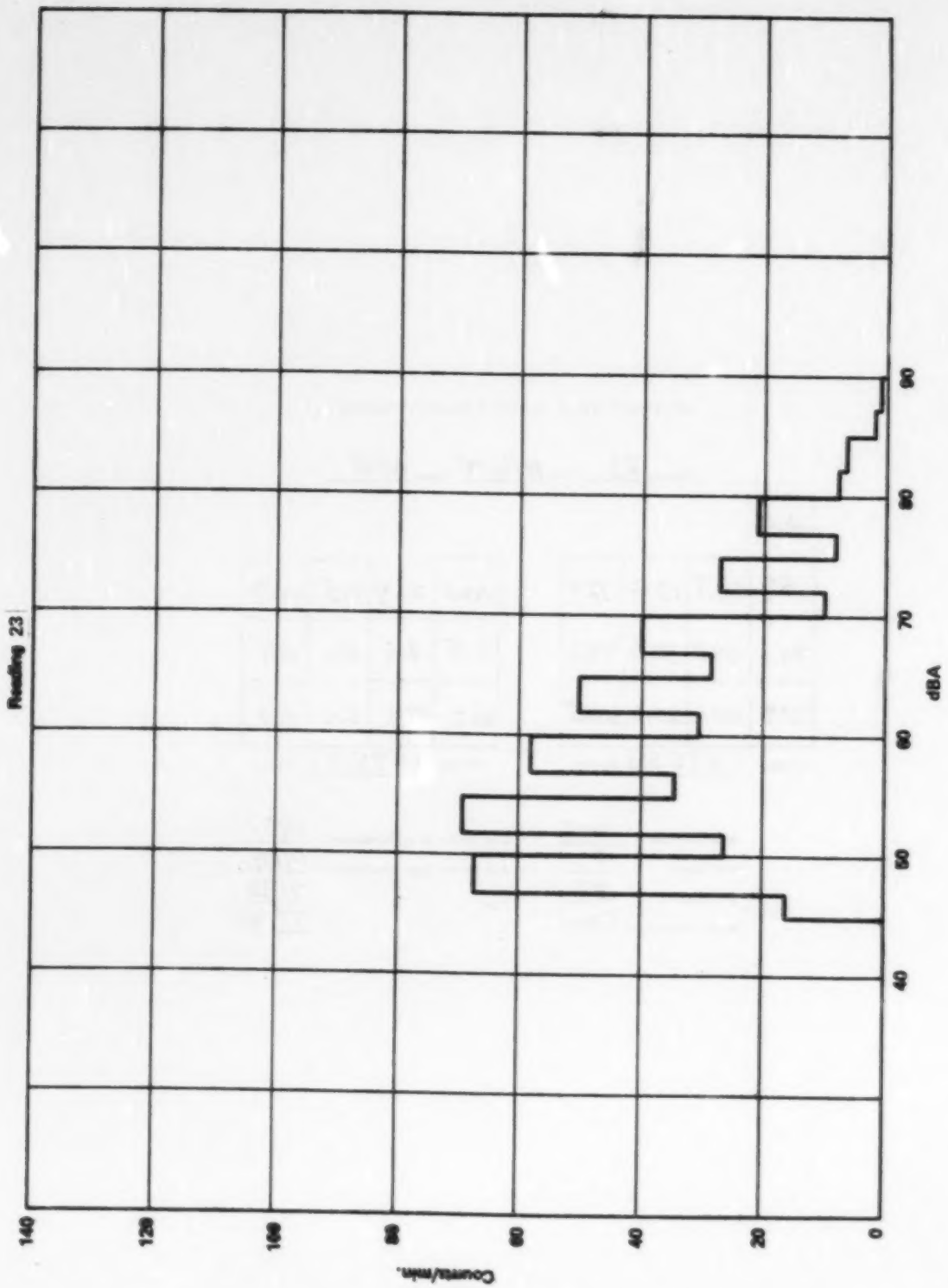
Weather Conditions Clear

Raw Vehicle Count Northbound 1451

Raw Vehicle Count Southbound 1409

$L_{eq}$ 71.33

$L_{dn}$ 77.80


Reading 23
140
120
100
80
60
40
20
0
Counts/min.
90
80
70
60
50
40
dBA

## LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 24 Date 11/6/74 Time 2201

| | | | |
|---|---|---|---|
| 0.0 | | | |
| 8.5 | 40.7 | 25.5 | 92.0 |
| 66.6 | 123.1 | 68.4 | 112.1 |
| 74.3 | 96.8 | 50.2 | 107.6 |

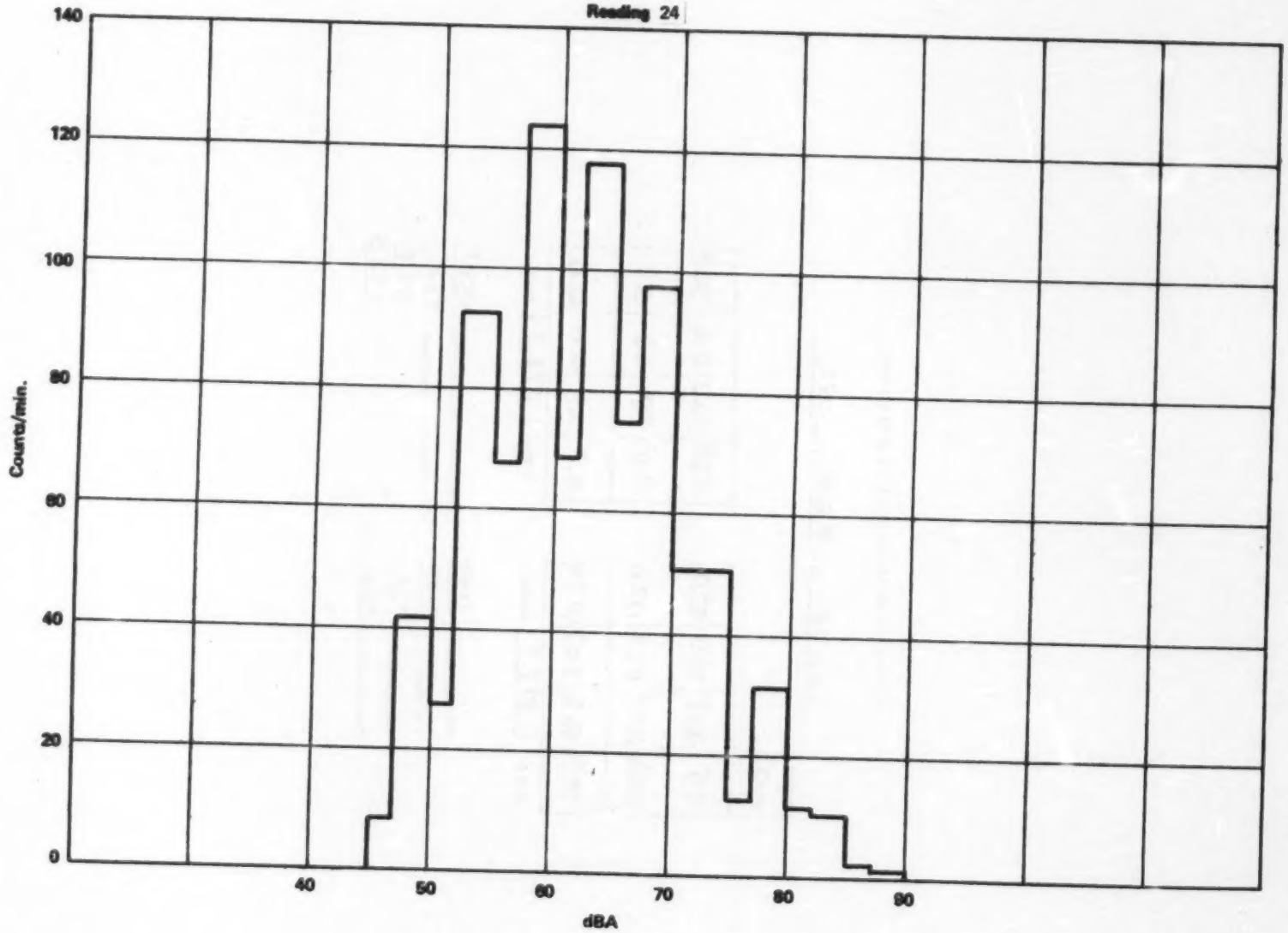
45 dBA 878.3 minutes

| | | | |
|---|---|---|---|
| 48.8 | 50.0 | 11.6 | 30.7 |
| 11.4 | 9.8 | 1.6 | 0.8 |
| 0.2 | 0.1 | 0.0 | 0.0 |

70 dBA 878.3 minutes

| | |
|---|---|
| Wind Direction | NNE |
| Wind Speed | 6-10 |
| Temperature | 27 |
| Weather Conditions | Clear |

| | |
|---|---|
| Raw Vehicle Count Northbound | 4547 |
| Raw Vehicle Count Southbound | 4851 |
| $L_{eq}$ | 71.04 |
| $L_{dn}$ | 77.23 |


Reading 24
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 25 Date 15 Feb 74 Time 0714

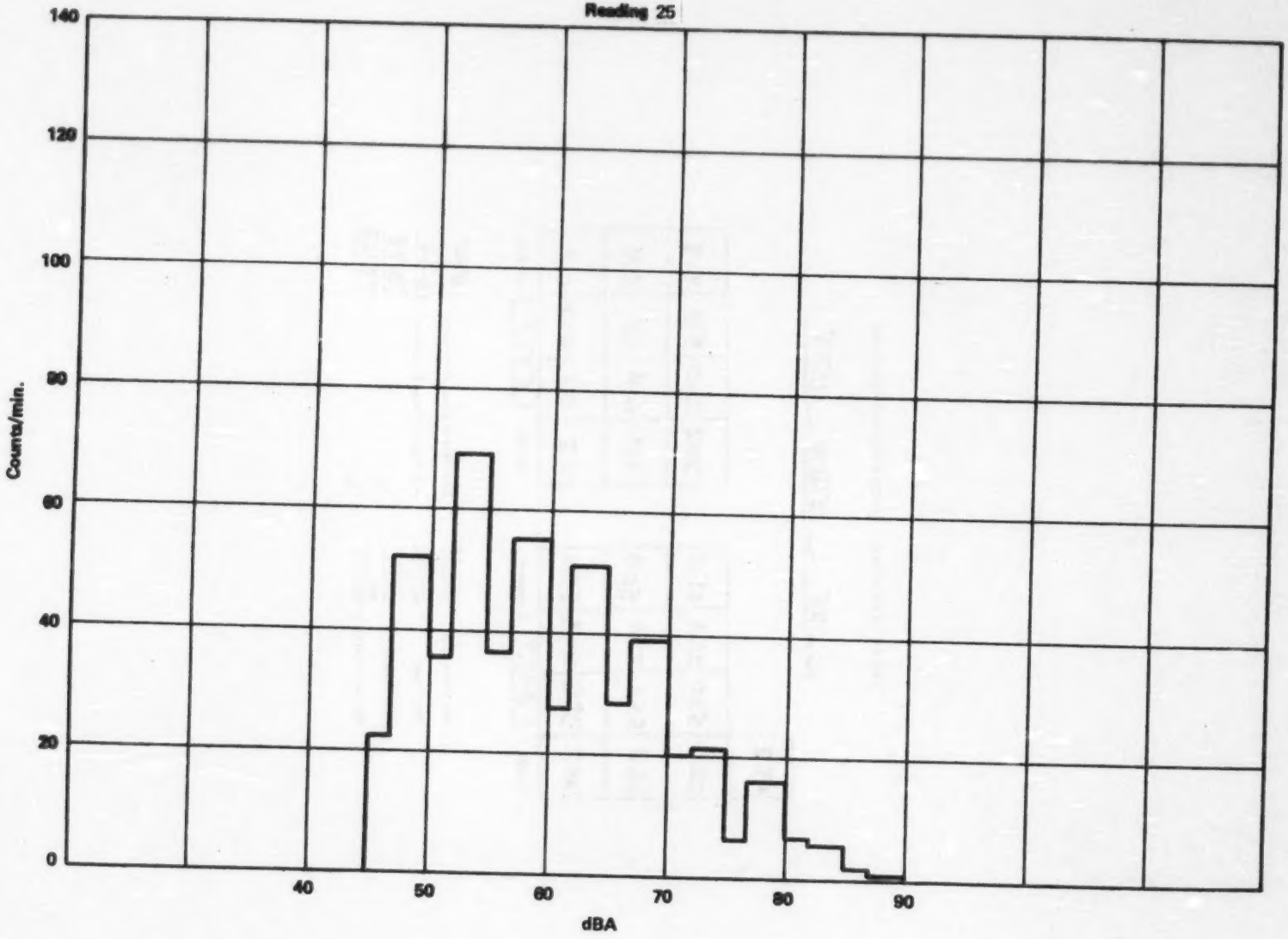
| | | | |
|---|---|---|---|
| 58.2 | | | |
| 27.0 | 52.0 | 35.2 | 65.0 |
| 26.2 | 55.1 | 27.0 | 50.9 |
| 29.2 | 38.8 | 20.3 | 54.8 |

45 dBA 547.7 minutes

| | | | |
|---|---|---|---|
| 20.2 | 21.0 | 5.8 | 16.3 |
| 7.0 | 6.4 | 1.2 | 0.8 |
| 0.2 | 0.1 | 0.0 | 0.1 |

70 dBA 547.7 minutes

| | | | |
|---|---|---|---|
| Wind Direction | NNE | Raw Vehicle Count Northbound | 1474 |
| Wind Speed | 3-5 | Raw Vehicle Count Southbound | 1634 |
| Temperature | 29 | $L_{eq}$ | 70.78 |
| Weather Conditions | Clear | $L_{dn}$ | 77.23 |


Reading 25
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

LEVERETT ROAD VEHICLE MEASUREMENTS

Test No. 26 Date 15Feb74 Time 1415

| | | | |
|---|---|---|---|
| 0.3 | | | |
| 7.9 | 41.9 | 30.0 | 63.0 |
| 37.7 | 54.7 | 27.4 | 51.7 |
| 29.2 | 31.6 | 12.3 | 35.0 |

45 dBA 425.1 minutes

| | | | |
|---|---|---|---|
| 14.1 | 12.6 | 3.4 | 11.3 |
| 5.2 | 3.8 | 0.6 | 0.5 |
| 0.0 | 0.0 | 0.0 | 0.0 |

70 dBA 475.1 minutes

Wind Direction _____

Wind Speed _____

Temperature _____

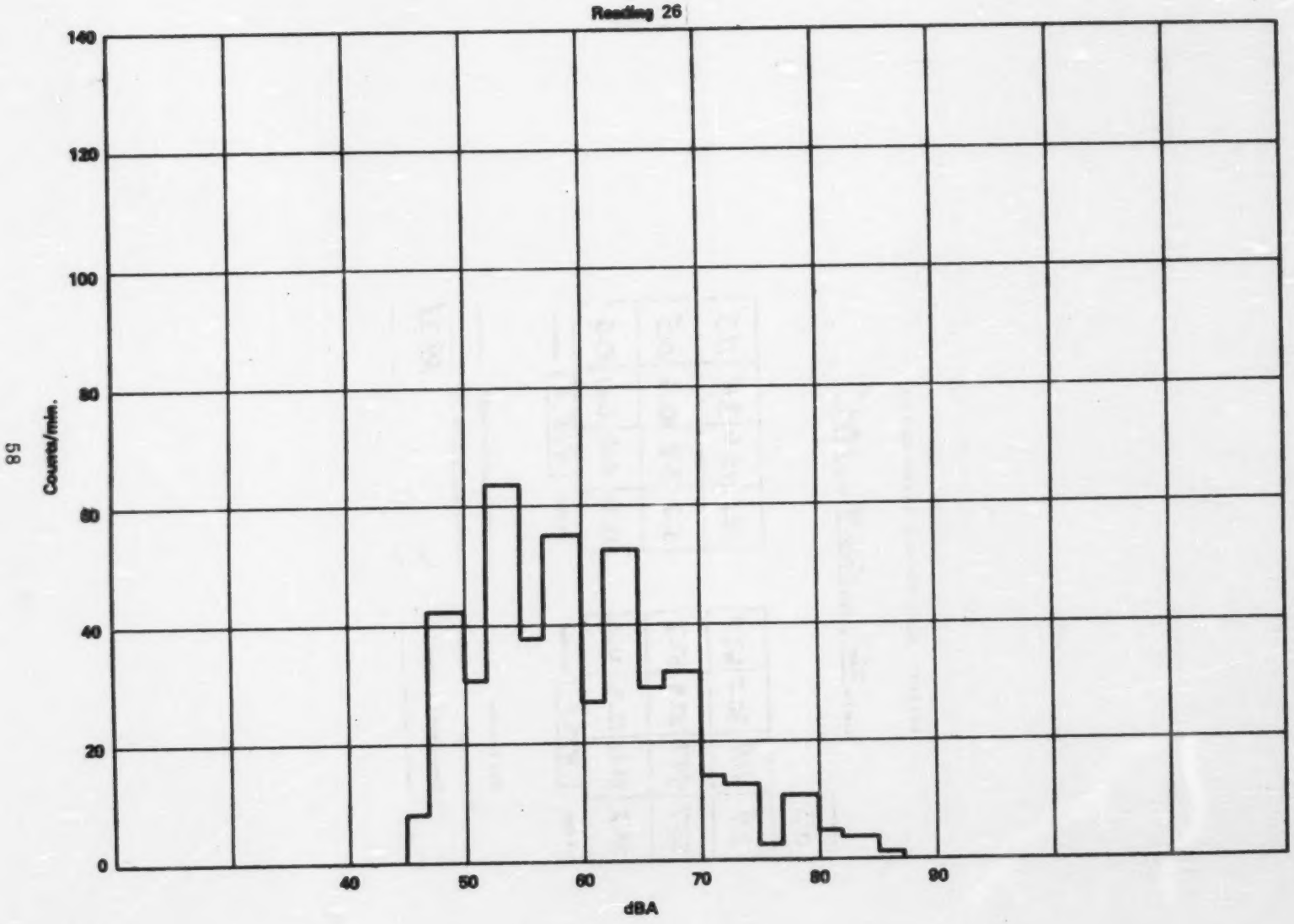
Weather Conditions _____

Raw Vehicle Count Northbound _____

Raw Vehicle Count Southbound _____

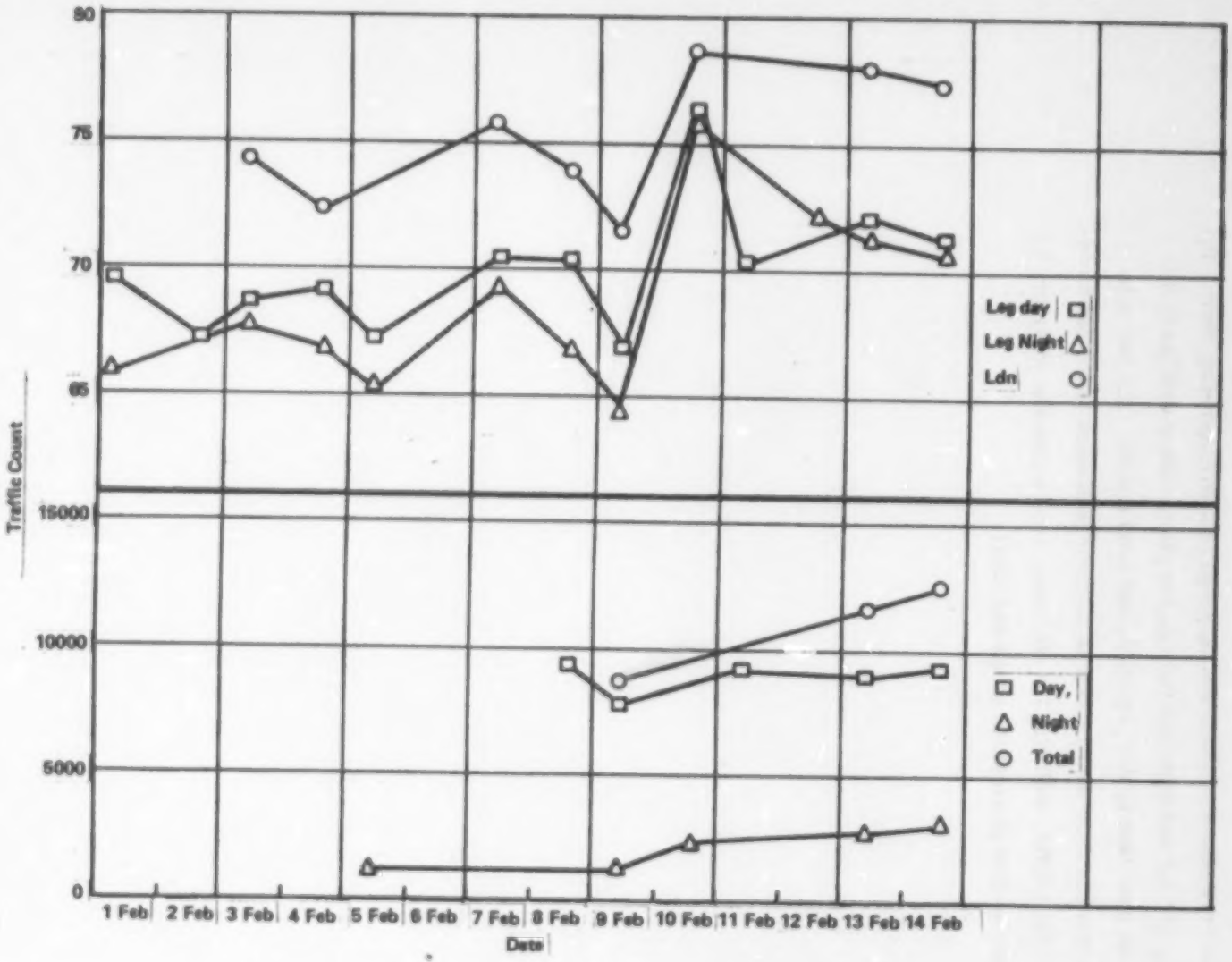
$L_{eq}$ 69.77

$L_{dn}$ _____


Reading 26
140
120
100
80
60
40
20
0
Counts/min.
40
50
60
70
80
90
dBA

## RESULTS

The results are shown on the following graph and corresponding chart. By dates, the $L_{eq}$ per day and night and the $L_{dn}$ are plotted along with the traffic measured in the near lane by day, by night, and total traffic. The raw data traffic measurements show that the flow is more or less equal in the two directions, so the total traffic, including the far lanes, can be considered double the traffic flow information given in the graph and chart.


80
75
70
65
Leq day
Leq Night
Ldn
Traffic Count
15000
10000
5000
0
Day,
Night
Total
1 Feb
2 Feb
3 Feb
4 Feb
5 Feb
6 Feb
7 Feb
8 Feb
9 Feb
10 Feb
11 Feb
12 Feb
13 Feb
14 Feb
Date

| Date | Traffic Flow (Day) | Traffic Flow (Night) | $L_{eq}$ (Day) | Leq (Night) | $L_{dn}$ |
|---|---|---|---|---|---|
| 1 Feb | | | 68.60 | 66.15 | |
| 2 Feb | | | 67.30 | | |
| 3 Feb | | | 68.85 | 67.85 | 74.42 |
| 4 Feb | | | 69.33 | 66.90 | 72.36 |
| 5 Feb | | 1266 | 67.28 | 65.30 | |
| 6 Feb | | | | | |
| 7 Feb | | | 70.43 | 68.34 | 75.64 |
| 8 Feb | 9467 | | 70.26 | 66.59 | 73.75 |
| 9 Feb | 7848 | 1079 | 66.91 | 64.51 | 71.35 |
| 10 Feb | | 2396 | 75.96 | 71.25 | 78.54 |
| 11 Feb | 9285 | | 70.37 | | |
| 12 Feb | | | | 71.94 | |
| 13 Feb | 8911 | 2860 | 71.72 | 71.33 | 77.80 |
| 14 Feb | 9398 | 3108 | 71.04 | 70.78 | 77.23 |

Summary Results of Traffic Flow and Noise Level

| BIBLIOGRAPHIC DATA SHEET | 1. Report No. 550/9-74-010 | 2. | 3. Recipient's Accession No. |
|---|---|---|---|
| 4. Title and Subtitle<br>Environmental Noise Measurements on Interstate 57 During and After Truck Strike | | | 5. Report Date<br>June 1974<br>6. |
| 7. Author(s)<br>P.D. Schomer and B.L. Homans | | | 8. Performing Organization Rept. No. |
| 9. Performing Organization Name and Address<br>Construction Engineering Research Laboratory<br>U.S. Department of the Army | | | 10. Project/Task/Work Unit No.<br>11. Contract/Grant No. |
| 12. Sponsoring Organization Name and Address<br>Environmental Protection Agency<br>Office of Noise Abatement and Control<br>Crystal Mall #2, 1921 Jefferson Davis Highway<br>Arlington, Virginia 20460 | | | 13. Type of Report & Period Covered<br>Final<br>14. |

15. Supplementary Notes

16. Abstracts

Noise and traffic-count data were recorded and analyzed during and immediately after a nationwide stike of independent truckers. This report presents statistical noise levels, equivalent sound level ($L_{eq}$), and day-night level ($L_{dn}$) for a two-week data-gathering period. From these results, it is possible to infer the truck contribution to highway noise.

17. Key Words and Document Analysis. 17a. Descriptors

TRUCK NOISE, HIGHWAY NOISE, $L_{dn}$, $L_{eq}$

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group

| 18. Availability Statement | 19. Security Class (This Report) | 21. No. of Pages |
|---|---|---|
| Not restricted. Limited supply available in Office of Noise Abatement and Control | UNCLASSIFIED X | |
| | 20. Security Class (This Page) UNCLASSIFIED X | 22. Price |

FORM NTIS-35 (10-70)

USCOMM-DC 4